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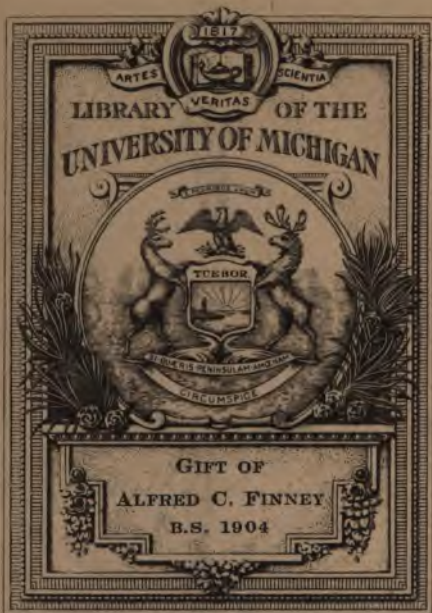
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The
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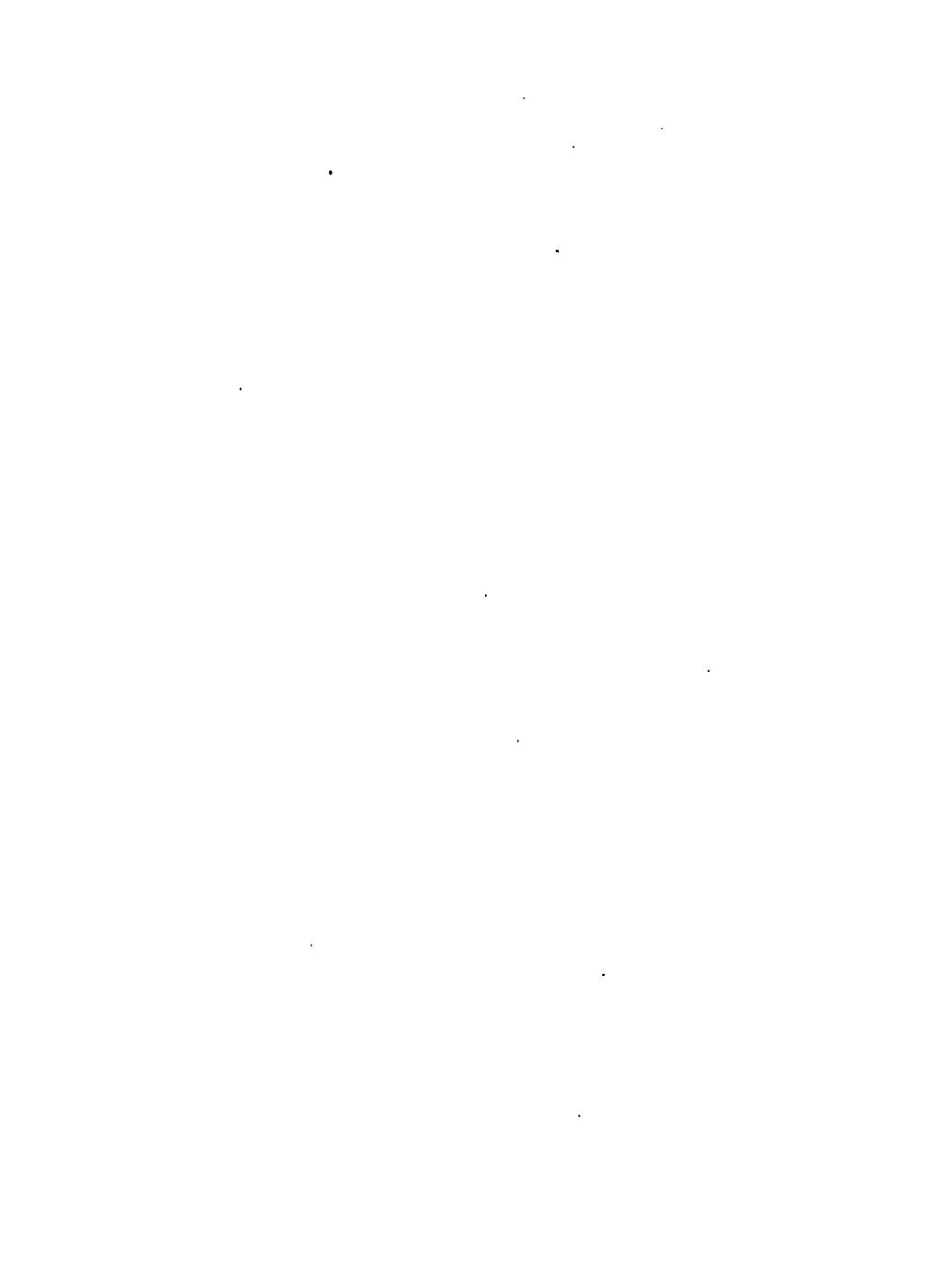


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THE
CURIOSITY SHOP

OR

QUESTIONS AND ANSWERS

CONCERNING THE

LUMBER BUSINESS

A Compilation of Inquiries to the Editor of
the **AMERICAN LUMBERMAN** and
Answers Thereto

CHICAGO
THE AMERICAN LUMBERMAN
1906

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PREFACE.

A quarter of a century's efforts to answer questions pertaining to the lumber industry of the world have placed on file in the AMERICAN LUMBERMAN'S records questions and answers pertaining to every conceivable phase of the business. A great deal of this matter relates to current events of importance at the time they were printed but of no permanent value. Some of them are mere expressions of opinion or discussions arising between the editors and men identified with some department of the business. Others are of an enduring character and of as much value ten years hence as they were at the time they originally were printed.

This mass of information has been carefully sifted, the chaff eliminated and the sound grain compiled in book form for the benefit of the trade.

In compiling this book the editors were confronted with a wealth of material from which to select. It was not possible to add indefinitely to the size of the book, hence it became necessary to omit many questions and answers which could have been used to good advantage. If this publication meets with the reception which we believe it should receive, another book of equal size will be prepared so that additional information of like character may be put into permanent form.

The question and answer department in the AMERICAN LUMBERMAN has been conducted without fear or favor and with the sole idea of making it of value to the readers and friends of the paper. We believe it has been of

more than usual interest, and judging from the letters of appreciation received it evidently has met with the favor and approval of those who have submitted problems for discussion or sought information in regard to points on which they were in doubt. Those who have helped in making "Editorial Discussions With Correspondents of the AMERICAN LUMBERMAN" the interesting feature it has ever been are now given an opportunity to secure answers to their problems in permanent, enduring form, which also includes answers to hundreds of other questions which have been propounded.

ARRANGEMENT.

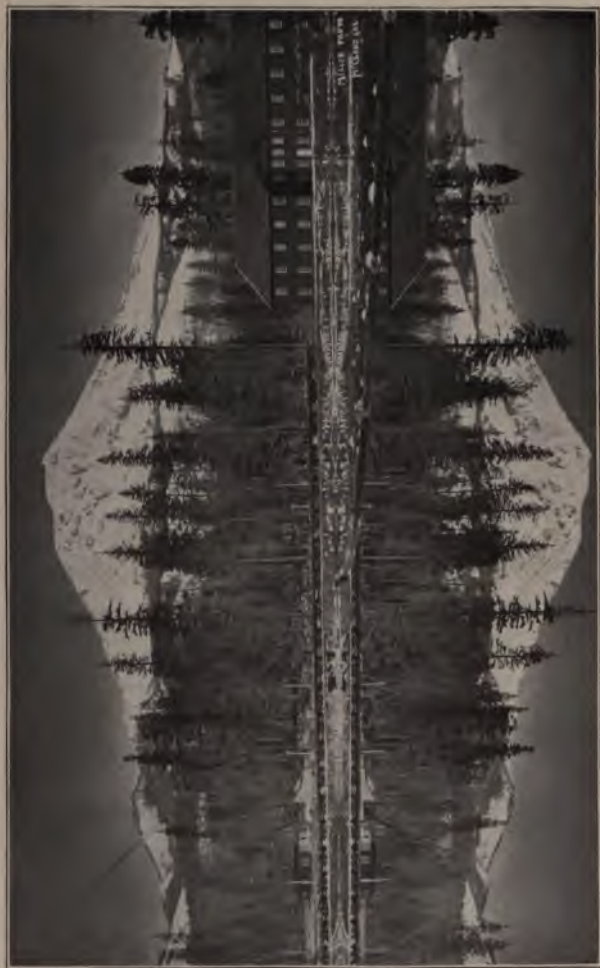
Endeavor has been made to make the arrangement as simple and logical as possible. The different parts or chapters have been subdivided, each subdivision embracing matters pertaining to some one phase of the general subdivision of the work. For instance, under the head "Legal" are given Contracts, Liens, Liability and General, which last subdivision embraces matters so diversified as not to admit of subdivision.

In conclusion: If you do not find answers to your questions in this book, write out your problem and submit it to the AMERICAN LUMBERMAN and receive an answer direct or through its columns. This department belongs to the readers; this book also belongs to the readers, title to which may be established by tendering the small sum of \$2.

CONTENTS.

PART.	PAGE.
I. Legal	9
II. Retail	54
III. Commercial Woods.....	99
IV. Logging	168
V. The Sawmill	216
VI. Lumber	269
VII. Statistical	329
VIII. The Trade	369
IX. Financial	380
X. Associations	391
XI. Timber	402
XII. Forestry	424
XIII. Transportation	438
XIV. Miscellany	480





ONLY REFLECTION EVER CAST ON THIS LOG POND.

PART I.—LEGAL.

CONTRACTS.

To Establish a Contract.

In a suit for the enforcement of an alleged contract of sale, what would be considered competent and binding evidence of the existence of such an instrument?

There must be either a regular contract, a written memorandum containing the provisions of a sale contract, correspondence bearing a sufficient relation to the subject matter to show that it pertains to it, or creditable evidence of verbal agreement.

Indefinite Contracts.

An order was placed for 17,500 feet of 4-inch A edge grain yellow pine flooring with the request for immediate shipment and an acceptance was received stating that shipment would be made as soon as a car could be obtained. The order was cancelled thirty days later, the cancellation reaching the shipper before the stock had been loaded on the car. Thereafter the shipper sent 14,000 feet of A and 1,000 feet of B edge grain yellow pine flooring. Is the consignee legally justified in refusing to receive the shipment?

Custom in the lumber business has always permitted the buyer to cancel an order prior to date of shipment, provided standard stock has been ordered. When a contract has been made for special sizes and the mill is

put to extra expense in getting out goods it is, of course, understood that the buyer must accept them if tendered for delivery within a reasonable time.

While the buyer has always exercised the privilege of canceling an order it is doubtful if this is a legal right though it is the general custom. In the case cited it would seem that the order was not filled according to agreement; that is, instead of shipping 17,500 feet of A edge grain flooring only a part of the flooring—14,000 feet—was A grade and 1,000 feet of B grade. The buyer would have a right to reject the 996 feet of the grade which was not ordered. As to the difference between the amount of flooring ordered and that received considerable variance of opinion as to whether the seller was obliged to furnish this at the same price doubtless would be expressed by lumbermen, but even had the car in which the lumber was shipped been filled to the visual capacity the remainder of the order could have followed afterward as a part of the shipment at the same rate, provided it was covered in the same bill of lading and shipped at the same time.

From the statement given the contract was clearly violated by the seller and we think a lamentable lack of business enterprise and business courtesy was shown if the outline of the case by the buyer be true in every particular.

Leasing Turpentine Rights.

Can the owner of a homestead make a valid lease conveying the turpentine rights to the timber on his land without the signature of his wife?

The signature of the wife of the lessor and her separate and apart acknowledgment the supreme court of Alabama holds are not necessary to the validity of a lease granting to the lessee for a certain period the

turpentine privileges in the pine trees standing upon the homestead of the lessor. The court says that the owner of a homestead who is a married man may, if it is timbered land, fell the timber for the purpose of making the land suitable for cultivation or, for that matter, he may destroy the timber growing upon it or he may sell it after he has felled it; and this he may do, although the doing of it may destroy the market value of the land, and he has the undoubted right to extract from the pine trees upon it the gum or rosin without molestation or hindrance.

Time of Delivery Must be Observed.

Where material has been contracted for to be delivered within a certain time and men employed to work it at the date delivery is due, is the consignor liable for the hire of the men so employed?

Where lumber is contracted to be delivered at a specified place and time and is not delivered on or before the date specified the assignee may recover an amount equal to the wages of the men employed by him in expectation of having the lumber to work with, or in an amount equivalent to such time penalty as may have been involved in the contractors' agreement to build the structure engaged upon within certain time limitations.

Implied Warranty.

If a contract for the purchase of an engine is made in which the size and capacity wanted are stated and the sellers know that the machine is to be used to run a saw mill, then in the event that the engine furnished is smaller than that ordered, would the buyer be justified in assuming that it would do the work and in installing and operating it in a saw mill?

The testimony disclosing a contract for the sale of

an engine of a certain make, size and capacity, where it would seem a reasonable inference that the sellers knew that it was to be used to run a saw mill for cutting logs into boards, the supreme court of North Carolina holds that their guaranty that the engine would develop the prescribed horsepower and would be plenty large enough to operate the mill must, in the light of these facts, be construed as an assurance that although the engine was 9x12 instead of 10x12, as contracted for, it would develop for this particular use the same power as the engine contracted for, or that they would make it do so.

Status of Subcontractor.

When is a lumberman a subcontractor?

He is a subcontractor when he sells material to the contractor who has been employed by the owner or the authorized agent of the owner, and is sub-subcontractor when he sells to a subcontractor. Thus a contractor may have the contract for the erection of an entire building. He sublets the carpenter work to a carpenter contractor and the latter employs the lumberman to furnish the lumber, who thus becomes subcontractor to the subcontractor. Whether a contractor, subcontractor or sub-subcontractor the duties upon which right of lien is based are the same, namely a contract for the sale of the material and proof that the latter has been delivered at the place of delivery.

Modification of Contract.

We quoted a prospective customer prices upon a list of building materials he submitted. Later the contractor gave us an order varying from the first submitted and without otherwise accepting the terms. Several weeks later a

member of our firm discovered a mistake had been made and as the offer had not been accepted it was withdrawn. Have we a right to do this?

The question is not entirely clear. If the offer had been accepted the withdrawal, without it were mutually satisfactory, would be inoperative. Inasmuch as a new description was introduced, in part at least, it does not seem that the contractor could insist upon taking advantage of the terms originally quoted. In a case of this kind a court once held that the giving of the order did not constitute an acceptance of the first proposal of the firm making the quotation. In this, as in other cases, the minds of the two parties must meet; if they do not, no contract exists.

Contract to Sell Defined.

In acknowledging an order we recently placed a manufacturing company said: "We are in receipt of your order No. 139 which we will ship for you as soon as is possible. We only size our material to 1% on a 3/4-inch basis. This is what our 2x10 will be, that is 1% x 9%. You will understand this stock will be No. 1 common sized to these dimensions. We accept the order under these conditions. We have placed the order with our mill and told them to ship out as soon as possible." Five months later we wrote asking if this acceptance was a joke or if they really intended to furnish the lumber. Inasmuch as the price is now higher we are somewhat in doubt as to whether we will receive it. What we would like for you to decide is whether or not we have a legal contract with the manufacturer.

Taking it for granted that the reservation made in the letter of acceptance met with the approval of the buyer this correspondence certainly resulted in a binding contract as the minds of the two parties met. A case similar to this was submitted for arbitration, the facts being somewhat involved by a later denial on the part of the manufacturer of ever having accepted the order.

This case, however, seems to be one of plain evasion, the mill conveniently forgetting that it had ever booked such an order and this convenient act was doubtless due to an advance in prices between the time the order was placed and the date when the dispute arose and was submitted for settlement. The law laid down this rule, that when a proposition, either oral or written, is submitted and accepted, a contract exists from that moment and damages can be claimed for its nonfulfillment.

Right to Reject Shipment.

May a consignee refuse a car of lumber the contents of which are from 7 to 10 percent below the standard grading or below the grade asked for?

There does not seem to be any court ruling covering the exact line to be drawn on grades below which the consignee would be justified in refusing to accept the shipment. The courts naturally would allow a reasonable variation from the specifications called for, but where the variation is great enough to seriously affect the grade or grades as defined in the contract there is no question but that the consignee would be sustained in refusing to receive the shipment. Such refusal, however, would have to cover the whole car, the consignee would not be allowed to pick out such lumber as in his judgment came up to the grades called for and leave the rest. He would have to accept or refuse a shipment in its entirety.

When Retailers Are Original Contractors.

When is a retail lumberman an original contractor?

He is an original contractor when he sells directly to the owner or the authorized agent of the owner. In such a case a lien attaches on the date of the contract for the sale of the lumber.

Penalty for Failure to Deliver Logs.

If a contract is made for the delivery of certain logs or lumber at a specified point at an agreed delivery price on or before a certain date, what damages could be recovered by the consignee for failure to make delivery as specified?

Damages could be secured for an amount equivalent to the difference between the price mentioned in the contract and the market value at the date delivery should have been made. No allowance would be made for expected profits on the transaction.

Remedy for Use of Inferior Material.

Where a contract calls for certain grades of material to be used in the construction of a building and inferior materials are used has the owner of the building a remedy?

The owner of the building in such a case may sue for and collect damages in an amount equal to the difference between the building as it stands and what its value would have been had it been built strictly according to contract. An authority governing this point is the case of the Elwood Planing Mill Company against Harding, which was decided in the appellate court of Indiana.

Specific Contract Versus Established Custom.

A asked for offers by the following letter.

"Please quote delivered Chicago on 50,000 feet $1\frac{1}{4} \times 4$, 18 feet. All Heart, D. & M. to $1\frac{1}{2} \times 3\frac{1}{4}$ & trimmed to 8 feet—8 $\frac{1}{4}$ inches exact."

B replies as follows: "We quote you delivered Chicago on 50,000 feet $1\frac{1}{4} \times 4$ —18 feet Heart D. & M. to $1\frac{1}{2} \times 3\frac{1}{4}$ and trimmed to 8 feet 8 $\frac{1}{4}$ inches \$20 net. Stock will be green."

A wires acceptance of this offer and confirms with written order reading as follows: "Ship to ———, Chicago &c. 5,600 pieces $1\frac{1}{4} \times 4$ —18 feet Heart D. & M. to $1\frac{1}{2} \times 3\frac{1}{4}$ & trimmed to exactly 8 feet—8 $\frac{1}{4}$ inches at \$20. Delivered."

Party B acknowledges this order with carbon copy reading as follows: NOTICE—Your order is entered on our books in accordance with this carbon copy. If incorrect in any way advise immediately before shipment is made: 50,000 feet $1\frac{3}{4}\times 4$ —18 feet Heart D. & M., to $1\frac{1}{2}\times 3\frac{1}{4}$, and trimmed to 8 feet— $8\frac{3}{4}$ inches, price \$20. Delivered Net."

The questions in controversy are, "What size did A purchase and what size should B invoice and count this material to A at?"

This proposition is at first sight so simple that it is difficult to understand how any dispute could arise from it or any difference of opinion develop. A bought and should pay for pieces of lumber $1\frac{3}{4}$ inches thick, 4 inches wide and 18 feet long, which measure $10\frac{1}{2}$ feet each, board measure. As an accommodation, or the result of work included in the price, A was to dress and trim these pieces to certain specific sizes; but his invoice, according to the contract, must estimate them at $10\frac{1}{2}$ feet each.

If the sole questions in controversy be "What size did party A purchase and at what size should B invoice and count this material to A?" the answer is absolutely simple and plain, as above. It would not do for B to charge for rough size of 2×4 18, because he specifically agreed to the $1\frac{3}{4}$ -inch thickness, though it is not standard.

But if all the essential parts of the correspondence are given and the figures and wording are exactly reproduced a number of questions might be lugged in. If A's literal instructions were to be followed B should have shipped him 5,600 pieces $1\frac{1}{2}$ inches by $3\frac{1}{4}$ inches and 8 feet $8\frac{3}{4}$ inches long, having absolute board measure contents of 19,880 feet. They would be billed, however, at 5,600 pieces $1\frac{3}{4}$ by 4 inches, 18 feet long, having a measure of 58,800 feet. We defy anybody, confining himself to the strict letter of the correspondence

and ignoring common sense or what the buyer meant to say, what he wanted or what the seller understood him to say and wish, to make anything else out of it.

It is a common enough thing for a man to buy 10-inch lumber and have it sawed and then worked to specific dimensions. In this case A did not ask to have his 18-foot stuff cut in two and then trimmed to specific dimensions, but to "trim" the 18 foot stuff down to 8 feet $8\frac{3}{4}$ inches long. If that doesn't authorize the mill man to cut something more than nine feet off each piece and keep it, and yet charge the buyer for it, we don't know what the English language means.

Another little point: How under the sun is anyone to ship any number of pieces measuring $14\frac{1}{2}$ feet each, or 12 feet each, and have them come out as even 14,111 feet?

Still another point: A asked questions in 14,111 feet; getting the price he accepted by wire in 14,111 feet; then he changed to other 14,111 pieces, which would be 56,555 feet. That is approximately the value (whether the telegraphic or written order is not material), on the basis of 56,555 feet the price was as it changed in any way to adjust immediately, before shipment is made." Nothing is said as to whether any adjustment was or was not made.

Unloading Not Accomplished

Does the unloading in the contract of a car of railroad material may contain some of the material or is it to be understood that the ordered quantity is to be unloaded?

Unloading a car of material from the railroad is an accepted term. The title of the material passes to the buyer when the bill of lading is received and the car is loaded by the carrier. The buyer's liability for the material is not affected.

upon the lumber being of the grade specified in the order, otherwise the contract is not fulfilled. It would work a hardship upon the buyer of lumber who usually is unable to inspect it at the point of shipment to compel him to accept a car because he had unloaded it for inspection.

Unilateral Timber Contracts.

We have a contract to saw all the timber that may be supplied us by a certain party, but the instrument does not state any amount and we desire to know if you have any information on this matter that will enable us to find out where we stand.

A case similar to this has been passed upon by the supreme court of Georgia. It related to a contract by which one of the parties undertook to saw, at a given price and in a specified manner, all the timber which the other party furnished during a stated period, but which did not bind the other party to furnish any timber. The supreme court of Georgia holds (*Harrison & Garrett versus Wilson Lumber Company*, November 14, 1903, 45 Southeastern Reporter, 730) this contract is unilateral, or one sided, and cannot be made the foundation of a suit by the party promising to do the sawing for damages against the other party for his failure to furnish timber to be sawed. If, under such a contract, timber actually should be furnished by one party and sawed by the other an obligation would arise on the part of the person furnishing the timber to pay for that actually sawed in accordance with the terms of the contract.

Deficiency in Acreage.

Please state briefly what sort of settlement would be proper when the purchaser of timber by the acre finds, after having paid a large proportion of the price asked and cut

half of the tract, that a shortage exists in the acreage—the survey having disclosed such shortage after payment was made and timber cut.

In a sale of timber growing upon land, if the purchase is by the acre, the supreme court of Georgia holds (*Martin versus Peddy*, August 12, 1904, 48 *Southeastern Reporter*, 420) that, under the civil code of that state, a deficiency in the number of acres may be apportioned in the price. This is true, although both parties have equal opportunity to judge for themselves as to the number of acres and act in good faith.

If a sale of growing timber be at a stipulated price an acre—a given portion of the purchase money to be paid in advance; the balance, when half of the number of acres, to be determined by a survey, shall be cut by the vendee—and upon such a survey it is ascertained that the actual number of acres sold, at the agreed price, aggregates a sum less than the amount paid in advance, the vendee may recover such difference from the vendor. In such a case the provisions of the civil code as to when relief will be granted in equity for a mistake of fact are not applicable.

Essentials of a Contract.

A writes a letter of inquiry for prices to B; B immediately replies, making quotations. A, immediately upon receipt of quotations, sends B an order based on these quotations. We would like to ask if, at this point, the transaction becomes a contract.

Not hearing from B in regard to the order A writes B four days after the order should have been received, asking him when the order would be filled. Three days after receiving A's letter B writes that his manager is out of town and that the quotation was an error, but that he will endeavor to fill the order as soon as his manager shall return. Twelve days after the writing of this letter by B he writes another letter, signed by his manager, stating that the quota-

tions were made in error and that he would not accept the order, also stating what the proper quotations should have been. A immediately replies to B and sends him the order based on B's amended prices. B returns the order, refusing to accept it, stating that he was under no obligation to do so. We would like to inquire whether A has any rights in this matter which B is bound to respect.

Referring to the contention of B that the first quotation was an error, A contends that there was no error and that there was nothing to show that there was.

The courts hold that a meeting of minds is necessary to make a contract and that until the provisions of counter propositions are thoroughly understood and accepted no contract exists. In the case cited above much would depend on the wording of the letter of inquiry and it is believed that should a case of this kind come up for hearing before a court the verdict would hinge to a considerable extent on the determination of this fact. It would seem reasonable to suppose that, an inquiry for prices having been answered and an order placed, the minds of the parties had met. In effect one party submits a proposition stating that for the consideration named certain kinds of lumber will be shipped and the order given is proof that this proposition is accepted. This statement and its conclusion must be modified by the fact that in the majority of instances prices are made subject to change without notice. In some instances prices are made to hold good for a certain length of time; notation to this effect or its absence would unquestionably have something to do with determining the merits of the controversy. By some it is contended that no contract exists until specific notice has been given that the order has been received and accepted.

If B after having made the quotation discovered an error and promptly notified A he was under no obliga-

tion to furnish the material. Having a second time been requested to name a price he should have had ample opportunity to rectify any mistake that had been made and the presence or absence of the manager would have nothing to do with the binding character of the agreement, though it appears that the manager himself made the second quotation. There can be little if any doubt but that B was under obligation to furnish the material on which he had made two sets of quotations, both of which had been accepted by the prospective purchaser. Good business judgment should dictate in this and the majority of institutions would fill the order rather than have any trouble or ill feeling about it.

Disagreement as to Quantity of Timber Cut.

A contracted for a specified number of trees at a certain price. A disagreement resulted as to the method of accounting for the trees and the vendor endeavored to show that a greater amount of lumber had been secured than could have been cut from the number which A contended had been used.

The supreme court of Mississippi has held that a suit of this character is not sustained merely by proof tending to show an estimated amount of timber had been secured, which furnished the jury no definite means of determining the number of trees that had been cut and removed. The court held that the rule as to proof required to justify recovery is that the plaintiff must show with reasonable certainty what trees were severed from the soil by the defendant or his servants. One may sue for the value of trees cut from his land, and join in that suit a count for the value of the timber contained in the trees, and, on proper proof, may recover upon either count. In such case the proof must show with reasonable certainty the number and value of trees cut by the defendant or his employees, or the

amount and value of the timber coming into his possession. The testimony of a witness, based on information obtained from various sources, as to the number of trees cut and the amount of timber said to have been received by the defendant, the court holds, was hearsay and inadmissible. His estimation of the amount of timber at a certain mill was inadmissible because there was no proof of the land from which the timber came. Likewise, the court holds that it was error to permit a witness to testify as to his measurement of stumpage on the land in question, because it was not shown by whom the trees were cut, or whether before or after the defendant ceased to be the owner of the land.

LIENS.

To Perfect a Lien.

What are the duties of a contractor in order that he may have a lien?

He must know, and be able to prove, that the materials contracted for have been delivered at the place specified in the contract. It is not enough for the contractor to be able to say that the account is on his book and that the buyer has not disputed that fact.

Limit of Lien for Labor.

If a logger contracts to cut a certain amount of timber for a millman, the work to be paid for by a specified sum, can the logger, in default of payment being made, keep the timber?

The logger's interest could not exceed the sum mentioned in the contract and to that extent he would have a lien on the logs. His only remedy would be to bring

suit to have the logs sold at auction, in which event he would receive the amount due him, the balance, less court fees, being returned to the owner.

Priority of Labor Liens.

Does a lien for labor take priority over a lien for material?

A lien for labor always takes precedence over any other contemporary lien.

Loggers' Rights for Lien in Michigan.

Have contractors, subcontractors and laborers a lien upon logs to cover their claims?

Michigan has what is called a log lien law, giving right of lien for such claims, and it is to be presumed that this precedent has been followed by the legislatures and courts of other states.

Priority of Mortgage Rights Over Subsequent Liens.

If A has a lot upon which there is a mortgage, and he buys material with which to build a house, does the lien of the mortgage take precedence over the lien of the contractor who furnishes the material for such improvement?

The mortgage would be considered as the first lien upon the property in the condition in which it was before the improvement was made. The lien of the material would be the first lien on the improvement upon the property.

Employees' Right to Lien.

Has an employee of an individual, firm or corporation a lien on the property of his employer?

This is a matter which is governed by state statutes.

In most of the states the employee not only has a lien but such lien takes precedence over any other claim against the property of said employer filed within a period of six months preceding the date the debt to the employee became due.

Kentucky Lien Law.

Are labor liens superior to mortgage claims in Kentucky?

Section 2487 of the Kentucky statutes provides that when the property or effects of any manufacturing establishment shall in any wise come to be distributed among creditors, whether by operation of law or by the act of the company, owner or operator, the employees of such company, owner or operator in such business shall have a lien upon so much of such property and effects as may have been involved in such business, and all the accessories connected therewith, including the interest of such company, owner or operator in the real estate used in carrying on the business. And section 2488 provides: "The said lien shall be prior to the lien of any mortgage or other incumbrance thereafter created, and shall be for the whole amount due such employees as such; and for wages coming due to the employees within six months before the property or effects shall in any wise come to be distributed among the creditors, and as provided in section 2487 the lien of such employees shall be superior to the lien of any mortgage or other incumbrance theretofore or thereafter created."

Buying Mortgaged Timber.

If we buy standing timber and agree to pay a certain price a thousand feet, logs to be scaled on skids in the woods; if we find there is a mortgage on the land upon

which the timber stands, would the mortgage apply to the logs on skids in the woods? When the contract was made nothing was said about there being a mortgage.

Growing timber is considered realty—a part of the land upon which it grows. Understanding this principle to apply in this particular case, the vendor could not legally convey a clear title to the timber because, as a part of the real estate, it is encumbered and the mortgagee would be entitled to protest against the sale of the timber, because he has an interest in it and it is probable that when the loan was made consideration was given to the value of the timber as well as the land. The holder of the mortgage could secure an injunction restraining the logger from cutting or removing the timber. The best solution of this case would be to obtain an agreement between the owner of the land, the mortgagee and the subsequent buyer of the timber whereby for a part of the purchase price the holder of the mortgage would relinquish all claim on the timber and this agreement should have the sanction of the owner of the land. Otherwise the logger may have to pay twice for his logs.

Salesmen's Lien Rights.

Have traveling salesmen the privilege of filing a lien against the property of the individual, firm or corporation by whom they are employed?

It is generally understood, and has been established by court decisions, that traveling salesmen have the equivalent of a mechanic's lien against the property of their employers. Thus in a bankruptcy case the salesman would be entitled to priority for wages earned under his contract within a period of six months preceding the filing of the petition.

Lien Law of Illinois Explained.

If a lumberman furnishes material for building a house and the owner mortgages the structure to secure additional funds would a lien filed upon this property by the lumberman take precedence over the mortgage if the latter were recorded first?

This is a matter which is wholly under the control of individual states. The following opinion covers the matter in Illinois and as a broad proposition may be said to delineate the governing statutes in a majority of the states:

1—The law of the state is that a mortgage or trust deed is not a lien on the property until the money which said mortgage or trust deed represents has been actually paid to the mortgagor, or to his order, by the mortgagee. The date of recording does not always govern.

2—A mechanics' lien is a lien from the date of the original contract, regardless of when the proceedings to enforce it are commenced or the notice is given or statement of claim for lien is filed.

3—If the mortgage were of record and the money represented by the mortgage actually paid out, prior to the making of the contract to improve the property, then the mortgage would be a first lien on the land and such improvements as were situated upon the land at the time of the making of the original contract. The party furnishing material or labor for additional improvements would have a first lien on the enhanced value of the property by reason of such additional improvements, and in such an event the court ascertains the value of the property before the additional improvements were placed thereon, and as to that value the mortgage is a first lien. The court would also ascertain the value of the property with the additional improvements placed on the property by the mechanic or material man, and as to that enhancement of value the mechanic or material man has a first lien, and in case of a sale of the property the funds are divided accordingly.

For instance, if a house and lot worth \$15,000 be subject to a mortgage and additions and improvements are made by the mortgagor, so as to make the property worth \$18,000,

the mechanic and material man have a prior lien to the extent of the enhanced value, or three-eighteenths of the proceeds of the sale. The increased market value added to the property would govern the extent of the priority of the mechanics' lien, without reference to the cost of the material or labor actually furnished.

4—If the mortgage is recorded after the date of the original contract or the moneys are paid out after the date of the original contract, then the lien is a first and paramount lien on the entire premises.

5—The term "original contract" means if the party furnishing material furnishes direct to the owner, then said party is an original contractor, and the lien would date from the date of his original contract with such owner.

If the party furnishing material furnishes it to the original contractor, who has an original contract with the owner to improve said owner's property, then such material man is a subcontractor, and his lien dates from the date of the original contract between the original contractor and the owner, regardless of when such original contractor purchases the materials from such material man.

LIABILITY.

Liability for Damage in Transit.

Where lumber is damaged by careless handling on the part of railroad employees in transferring it from one car to another who should be responsible?

The ordinary course is for the consignee to look to the shipper for an allowance equivalent to the damage and for the latter to put in a claim against the railroad company. There is no doubt as to the equity in the matter or of the liability of the carrier, but it is extremely difficult to collect claims of this kind. The trouble does not lie so much with the unwillingness of the carriers to pay the claims, but in the fact it is very difficult to prove carelessness on the part of the em-

ployees. The latter to protect themselves naturally will do everything in their power to shift the responsibility for the damage to the shipper.

Where Firm Is Not Bound by Act of Individual Member.

Can one partner in a firm or a member of a corporation bind his firm or corporation by contract to do or not to do any certain act which is not included in the ordinary business transactions of such firm or corporation?

The only way a firm or corporation could be so bound would be by its subsequent ratification of the contract or by its having given the contracting partner authority to act for it, either generally or in connection with this particular transaction, prior to the date of the contract.

Rights of Manufacturer When Lumber Is Sold Through Agent.

If an association recommends to its members that they refuse to sell to an individual firm or corporation because of the latter's unethical trade practices, can the party or parties so discriminated against sustain an action for damages?

In the case of S. A. Gibbs & Co. against the Washington Red Cedar Shingle Manufacturing Association, an action involving damages in the sum of \$52,000, the allegation of the plaintiff was that the defendant had recommended that its members refuse to sell to the plaintiff on the ground that the latter made a practice of cutting prices. This allegation was admitted by the defendant. The suit was tried in the United States Circuit Court, Seattle, Wash., and judgment given for the defendant on the ground that the association was not a trust, that it had a right to fix and maintain prices and to refuse to sell to any one. This case, however, did not

properly come under the jurisdiction of the circuit court, as the operations of the Washington Red Cedar Shingle Manufacturing Association were conducted wholly within the state and therefore did not in anywise come in conflict with interstate commerce regulation.

Principal Bound by Act of Agent.

Where a manager is in absolute charge of the business of his employer is it possible for said employer to evade the consequences of an act of the manager made in his (the employer's) name?

In such a case any transaction entered into by the agent would be fully as binding as though the principal had been the contracting party. Where the manager is working in pursuance of general instructions and enters into a contract without specific authority for that particular transaction, but which is in accordance with the ordinary business policy of his principal as outlined by business done in the past, the legal presumption would be that he was acting under implied instructions and the principal would be fully bound. In either case the law would recognize the agent as having the power to do anything which his principal might do.

Liability for Loss in Transit.

When lumber contracted for at a delivered price is found by the consignee to be short and it is evident that the full order left the point of shipment who must stand the loss, shipper or consignee?

In a shipment of the kind outlined the consignor would have to allow claim for shortage by the consignee, providing such claim was substantiated, and seek recovery from the carrier. The order having been accepted on the delivery basis it would be immaterial to the receiver whether the lumber was lost in transit or had not been included in the shipment.

Liability of Architect.

Where an architect is superintending the erection of a house and the agreement has been made that all bills will be paid by the owner only upon order of the architect and the subcontractors have induced the architect to protect them in their claims, then in the event of a shortage of money would the contractors be able to hold the architects, as well as the owner, liable for the amounts due him?

The consensus of legal opinion appears to be that the architect could not be held unless by special agreement with the owner he had been created an agent and invested with an agent's powers.

Responsibility for Agent's Act.

A recent dispute in this city in regard to the actions of an agent who it is claimed exceeded his authority to bind his principal in matters for the transaction of which he was not empowered has created considerable interest and we would like to have your opinion as to the responsibility of the principal for such transactions on the part of his agent.

Probably the best means of answering the correspondent is to cite the decision of a Kentucky court in a case where trees were cut by an agent of the seller before the title had passed. The decision states that a principal who, by an agent who is not an agent to cut timber, sells timber, the court of appeals of Kentucky holds (*Ayer & Lord Tie Company versus Davenport*, 82 Southwestern Reporter, 177), is not responsible for the acts of such agent if he thereafter, on his own account and not as agent, or within the apparent scope of his authority, cuts the timber so sold, for the principal is never bound by the acts of his agent beyond the apparent scope of his authority. The court also holds that where trees of certain kinds above certain dimensions on certain lands come to be sold title to no par-

ticular trees vests at the time in the purchaser, as the rule is that, where the things sold are to be ascertained or identified by a subsequent measurement, the title does not pass by the contract, and so, if the seller shall cut a tree, though a violation of the contract, the contractor for the trees will have no claim upon ties made from such tree in the hands of a purchaser of the ties. A similar ruling would probably hold good in regard to the controversy outlined, although the case is not presented with enough detail to warrant a decided opinion on this point.

Liability to Pay Advertised Prices.

Where a concern advertises for lumber, offering to pay a certain price, can one who ships in response to such advertisement and whose goods are accepted, collect the advertised price?

The supreme court of Georgia decided in *Robinson vs. Leatherbee Tie & Lumber Company* (48 *Southwestern Reporter*, 380), that a merchant who, by means of circulars and advertisements, solicits generally the shipment of goods to him at a certain price stated is under an implied contract to pay that price to one who, acting upon such solicitation, ships goods to him which are accepted; and the shipper may recover at least upon a quantum valebat (as much as it was worth), for the goods proven to have been shipped and received in accordance with the terms stipulated by the circulars so sent out.

Exercise of Ownership Rights an Acceptance.

On purchasing a car of shop and better inch cypress to be about one-third of each grade we requested the firm we bought from to dress the lumber in transit if they had facilities for doing so. We received a reply that it would be

impossible, and upon the car arriving we had it switched to a planing mill and dressed, unfortunately falling to have the mill report to us the grades before dressing. Upon receipt of the dressed lumber we found that it was not better than No. 1 and No. 2 common with a large portion of the latter grade. We notified the shipper that the car was at their disposal. They wired back to unload the lumber and hold for their disposition. They sent an inspector to grade the lumber, but upon finding that it had been dressed he refused to make an inspection. They have now sued us for the invoice price of the shipment. What are our legal rights?

In this case the buyer executed an act of ownership in sending the lumber to the planing mill for dressing and as a result is not able to return the goods in the condition received. It appears, therefore, as a proposition of law that the shippers are entitled to collect the agreed price of the lumber.

Manufacturer Bound to Fill Orders Accepted by Agent.

If a yard man should buy a bill of lumber from the agent of a manufacturer and the manufacturer later refuse to fill the order on the ground that the agent did not know the price at the time the sale was made, on account of an advance having taken place on the wholesale price, of which the agent had not been informed, could the buyer force delivery?

If he took the case to the courts the manufacturer would have to fill the order or pay the difference between the price at which the goods were contracted to be delivered and the price obtaining at the time of the refusal to deliver the goods. The fact that an advance had been made of which the agent had no knowledge would not excuse the manufacturer, for the courts would hold that he should have been informed of such advance immediately upon its having been made and his action in selling the goods would bind the concern for which

he acted as fully as it would have been bound by its own action.

Liability for Injury to Customer.

If a customer is injured through the breaking of a floor or falling of a stairway, in a yard in which he is inspecting lumber, can the owner of the yard be forced to pay damages for injuries sustained?

If the injured man can prove that the accident was one which might have been avoided through the exercise of reasonable care on the part of the defendant he can get judgment for injuries sustained. On the other hand, if he is injured by a collapse of a structure which the owner of the yard had no reasonable grounds to expect, he cannot obtain a judgment for damages.

Liability for Injury to Mill Employees.

What is the liability of a mill owner for damages covering an injury sustained by an employee through the breaking of a saw which struck a piece of iron spike which the inspector or "iron hunter" had failed to discover?

A case of this kind decided by the court of appeals in Kentucky (Covington Sawmill Manufacturing Company vs. Clark, 76 Southwestern Reporter, 438) resolved itself into the question of whether the inspector or "iron hunter" was a fellow-servant of the mill employee who was injured, to an extent which would prevent the latter from recovering from the employers the damages resulting from the negligence of the inspector. It was held that the high duty of an employer, knowing that the calling of his employee was a dangerous one, should take every reasonable precaution and in delegating the duty of making proper inspection to an employee that

employee became a vice-principal and not a fellow-servant. Therefore, a judgment of \$5,000 was sustained. The jury was instructed that, if they believed from the evidence that the "iron hunter" or inspector failed to exercise such care as is ordinarily exercised by ordinarily careful and prudent persons under the same or similar circumstances and in the same or similar business, and the injury resulted solely from that failure, it should find a verdict for the plaintiff. The case, therefore finally hinged upon the question of whether the inspector used due care in examining the log, and the jury having settled the fact involved judgment was given, which, upon appeal, was affirmed.

Commission Not Payable on Unfilled Orders.

Should a manufacturer pay commission on orders accepted but not filled?

There have been several legal decisions which seem to establish the rule that if a manufacturing company accepts an order and because of circumstances beyond its control is unable to fill it, in part or in whole, it is not bound to pay commissions on the lumber which it does not ship.

Liability for Injury to Employees.

To what extent is an employer responsible for the personal safety of his servants?

The supreme courts of several states have declared the master to be responsible for any injury occurring to his servants through the faulty construction of the machinery or tools he is given to use, the condition of the building or yard in which he is employed and for the results of incompetency on the part of his fellow employees. That is to say, in the latter case, if an

employee complains to his employer of the incompetency of his fellow employee and his employer agrees with him, the latter is liable for damages should an accident occur to the complaining employee through the incompetency of his fellow workman, except when the said incompetency is so glaring that no prudent man would hazard his safety by exposing himself to its results.

Obligation to Accept All or None.

We have a customer who ordered a carload of finish from us and after it was unloaded advised us that it was in his yard subject to our order, which ultimatum, no doubt, was brought about by the weakening of the finish market intervening the time he bought this and the time it was received. We, however, insisted upon an official inspection and the report of the inspectors shows that there was about 3,000 feet of off grade in the car. We have agreed to take the off grade out of his yard as per understanding before the inspection, but he now contends that he will not accept the stock on grade as found by the official inspector.

Shippers as a rule have contended that the carload is a unit which must be maintained intact. The argument has always been made that the buyer must accept all or none of the car. The case is not entirely clear, in that no details are given which tend to show whether objection was made immediately upon arrival of the lumber or whether the stock was held for some time and then fault found with its quality. Nor is it set forth that the amount of lumber to be shipped on this order was specified or whether an order was given merely for a carload of finish and the amount left to the discretion of the shipper. These facts would have much to do with determining the controversy. Relative to its legal aspect it was decided by the city court of New York (61 New York supplement, 493) that where lum-

ber had been received and retained for fifteen days this act constituted an acceptance and subsequent objection or complaint could not be entertained.

So many details are lacking in the case presented by the correspondent that it is impossible to give an opinion or to cite authorities bearing directly on it. In general, however, it is held that a buyer cannot be forced to receive lumber of a quality which was not ordered, and also it has been held in substance that where a grade of lumber is supplied lower than that specified in the order given the buyer had a right to reject the entire carload. He, of course, is given the privilege of unloading the car and inspecting it and this act does not constitute an acceptance.

GENERAL.

Repeal of Lieu Selection Provision of the General Land Laws.

When and how was the practice of obtaining forest land in exchange for practically valueless, arid or semiarid land ended?

Prior to May, 1900, the United States government allowed holders of government lands in forest reserves to exchange them for script covering an equal number of acres in any other part of the government land holdings, except in forest reserves. After the government had been mulcted for a number of years by the exchange of worthless lands for timber areas of many times their value Congressman Wilson, of Idaho, a member of the public land committee, in the month and year mentioned above, introduced a resolution calling upon the secretary of the interior to furnish full information regarding the land script which had been issued or called for upon forest reserves. A bill was then intro-

duced into both the house of representatives and the senate providing that holders of land within forest reserves should apply script towards the location of land of equal value only. The legislative machinery affecting this measure did not work rapidly and it was not until March 3, 1905, that the act was passed which finally settled the rights of holders of locations within forest reservations. This act embraced the abrogation of lien selection rights in forest reserves and thereafter holders of unperfected and patent claims within the forest reserves of the United States were without power to exchange them for any other lands of whatever character or value.

Right to Floatable Streams.

Has the general public any right to run logs on a floatable stream as against the wishes of the riparian owner?

The courts of Oregon and Michigan—and probably of other states—have held that the rights of the public in this regard are concurrent with those of the riparian owner and that each is entitled to a reasonable enjoyment of the privilege of the stream without unnecessary interference from the other. By a reasonable enjoyment is meant an exercise of this right such as common prudence would dictate and one which would not affect the rights of the one to the injury of the other.

Privilege Act of Mississippi.

What was the privilege act of Mississippi?

In 1902 the legislature of Mississippi passed an act requiring holders of timber who did not own the land upon which the timber stood to pay a "privilege tax" of \$25 for every 500 acres. Whether this was to be an

annual tax or was to be levied but once was not very clear.

Recourse for Misrepresentation of Credit.

When goods are sold on credit which has been secured through a misrepresentation of the financial standing of the buyer can the seller recover upon the ground that the sale was induced by such misstatement of facts?

Upon proof that the financial status of the purchasing concern was inaccurately stated to the seller and that the sale was made in consequence of such misstatement the courts have held that title remains in the seller. This is equally true whether the misstatement of finances by the buying concern was made in good faith or with intent to deceive.

What Was the Tap Line Case?

What was the tap line case?

Early in 1903 the Central Yellow Pine Association brought suit against four southwestern railroad companies to compel them to discontinue the allowance of what were called "tap line divisions." By this term was meant a division of the through freight rate from the mill to the destination of the shipment which was allowed the shipper by the carrier on account of his participating in the haul to the extent of his logging road. Briefly stated the contentions of the petitioners were that while a man whose mill was located in the timber, and who had built a logging road forty or fifty miles long, connecting said mill with a trunk line, was entitled to a rebate on the through rate from his point to destination, another man whose mill was located on the line of the carrier and whose logging road extended into the woods—simply taking the place

of a team or oxen in hauling logs to the mill—was not entitled to any division of the freight rate. The association contended that a division in favor of such an operator was a discrimination against the manufacturers who chose to haul their logs by team instead of by the use of a logging road.

The position of the man with the mill located in the woods not being assailed, the defense treated entirely of the mill man whose operation was located on the line of the carrier, but who hauled his logs by rail from the woods. In his behalf it was contended that the natural position of his mill was in the woods but the mere fact that he preferred to have it located outside and haul his logs to it for manufacture instead of building it in the woods, manufacturing there and operating the same road to carry the lumber to the point of shipment, was immaterial. The point was that by means of his logging road he placed his lumber on the line of the carrier.

The decision was that an incorporated logging road was entitled to consideration as a common carrier and its owner to a division of the through rates, but that an unchartered road did not have such right. The result was that the logging roads which before the decision had been operating without having been incorporated at once took out charters and divisions in the through rates continued as before the litigation.

Regaining Possession of Stock.

Where lumber or ties are purchased to fill a sale contract, the terms of which provide for a given specification, can the first seller of the material regain possession of his stock, as against the parties to whom delivery is to be made, in case the said first seller is dissatisfied with the inspection?

When a company has made a contract to furnish lumber, ties or other material of specified dimensions

and classifications to a purchaser, the latter's inspection to govern, and the company then contracts with a manufacturer for such ties or other material to fill said contract, title to the property passes to the contracting company immediately upon delivery of the material at the place where the same is to be inspected. Therefore the manufacturer cannot, because he is dissatisfied with the inspection or for any other reason, refuse to deliver the property to the third party.

Dead Timber Legally Classified.

What is the legal significance of dead timber?

According to a decision of the United States court of appeals, which affirms a decision handed down by the United States circuit court, dead timber does not necessarily mean trees that have rotted or which are completely dead but also includes trees that have ceased to grow or improve in size or value, trees that have started to decay or that have lost their energy. In the words of the court dead timber means, "trees which a wise and prudent man would cut in his own forest."

Points Decided by Interstate Commission on "Tap Line" Case.

Will you outline some of the points decided by the Interstate Commerce Commission in its opinion on the "Tap Line" case?

A railroad company may not bear a part of the cost of logging a mill.

Traffic originates where the shipment is first transported by a common carrier.

A tap line, if a common carrier, lawfully may receive a portion of the through rate regardless of ownership.

Tap line divisions are in violation of the Elkins law only where such allowances are paid to private carriers.

The milling-in-transit privilege may be applied to logs when they originate upon the line of any common carrier.

Whether or not the milling-in-transit privilege shall be extended to any particular case depends upon the facts. In such cases bills of lading should be issued from point of origin by originating line and show the privilege granted.

If a railroad company should be allowed to bear a part of the cost of logging a mill it would make no difference in what manner the logs were supplied it, whether by railroad, rafting or by wagon.

A common carrier may not charge one shipper a higher tariff than is collected from another where the service rendered is the same.

The milling-in-transit privilege is extended to extreme limit when it is construed to cover raw material sent to mills for conversion into lumber.

Divisions would not be considered excessive if mills were located in the forest and charges were made for carrying lumber to the main line.

The practice of granting tap line divisions is general, therefore no discrimination as between localities or individuals similarly situated can be urged.

While ordinary railroads are not required to publish proportions accruing to each line of any through rate, such publicity is recommended in this instance.

Agreements as to the divisions of a through rate must be made between two common carriers and cannot legally be effected between the lumbermen or any representative and a railroad.

The allowance eventually inures to the benefit of the mill company, if not directly, and that it does not alter

the transaction when the name of the party to whom the division is paid is changed.

Trackage rights of complainants, or any of them, have no bearing on the question of the legality of the tap line divisions.

POINTS NOT DECIDED.

Lumbermen may charter their logging roads as common carriers and lawfully receive a portion of through rates, but on what grounds they will be declared to be common carriers was not set forth.

It was pointed out that divisions were allowed on shipments to certain points and not to others, but no mention was made of this real or apparent discrimination. Whether such a condition comes within the provisions of the interstate commerce act was not decided by the commission.

Legal Arrival of Vessels.

Does the captain of a vessel have to report at the barge office of a receiving port before the law will consider the vessel to have arrived?

According to a decision rendered by Judge Kohlsaatt, of the United States Circuit Court for the northern district of Illinois, the jurisdiction of the authorities of the port in question extends for a distance of three miles from the docks of that port over the river, lake, bay or ocean upon which said port fronts and vessels which have come within such three mile limit will be considered as having passed within the jurisdiction of said port and to have completed their voyage, although they may not have actually reached the docks. Consequently a vessel arriving within such three mile limit before the going into effect of a tariff which otherwise

would have changed the duties upon its freight would not be affected by such duties.

Dower Rights in Timber.

There has been some discussion lately in regard to the interest a widow has in timber growing on an estate in which she has a dower right. It was claimed that a person so situated could sell timber or a part thereof, and I write to ask for information as to the legal status of a transaction of this kind.

It is not believed that a dower interest would give the possessor the right to sell timber. The laws of different states vary in regard to this matter. According to a late decision the only interest a widow has in the timber growing on land in which she has a dower estate, by right of her dower estate, the supreme court of Alabama holds (*Garnett Smelting & Development Company vs. Watts*, 37 Southern Reporter, 201), was such as was useful and necessary to the proper enjoyment of her life estate in the land. As such life tenant her right to use the timber growing on the land was for house, fire, or fence bote (purposes) and the like. Beyond this any cutting or destruction of the timber by her would have constituted waste, and for which she could have been enjoined by the reversioner or remainderman. Before she conveyed her life or dower estate in the land she had no interest in the timber on the land severable from her life estate in the land. She had no right to sell the saw timber from the land as such life tenant. Nor could she cut such saw timber otherwise than for proper and reasonable uses in the enjoyment of her life estate, such as those mentioned. When she conveyed her life or dower estate in the land the reservation in her deed of the saw timber on the land conveyed reserved to her nothing as against the reversioner.

The Uniform Bill of Lading.

What was the uniform bill of lading and what influence prevented its operation?

The uniform bill of lading was a measure proposed to be enforced by the railroads providing for an additional charge equal to 20 percent of the freight rate under which any shipment was made for the recognition by the carrier of a common law liability for the safe delivery of the shipment. It provided that where the railroad company was responsible for a limited liability only the rates would be the regular published schedule. This measure was to have been made effective January 1, 1905, but it raised a storm of protest from the shippers, who brought the matter before the Interstate Commerce Commission at its December (1904) hearing. The appellants were led by the Illinois Manufacturers' Association, and March 11, 1905, at a conference between the attorneys representing the railroads and those representing the shippers it was decided not to enforce the proposed bill.

The point brought out by the shippers and emphasized so strongly as to be the cause of the defeat of the proposed measure was that the railroads, in acknowledging the delivery of freight to them as carriers, by that act also acknowledged themselves bound to a common law liability for its safe delivery and that, this being so, to make an additional charge for such liability was simply an ingenious method of raising freight rates, while to diminish its liability without any compensating lowering of rates was in effect charging for a lessened service a price which purported to cover a full service. The logic of these contentions was so forceful and the decision which would be reached from a consideration of their presentment was so inevitable that the railroad companies deemed it advisable to concede the point to the

shippers before the matter was finally determined by the commission and the courts.

The Homestead Bill.

When was the Homestead bill passed?

This measure first came before Congress in 1859. At that time it passed the House but failed in the Senate and as a compromise between the two legislative bodies a bill was passed in 1860 which, however, was vetoed by President Buchanan. The Homestead bill, nevertheless, was successfully put through both houses in 1862 and was signed by President Lincoln May 20 of that year. The idea which culminated in the passage of this piece of legislation originated in 1848 under the head of the free soil movement. In 1852 the free soil democrats held a convention at which it was asserted that the public lands of the United States belonged to the people and should not be sold to individuals nor granted to corporations but should be held in trust for the benefit of landless settlers. Since the enactment of the homestead laws over 233,000,000 acres have been entered for settlement.

The Hedgehog Law.

What was the Hedgehog law?

This was a measure passed by the Maine legislature in 1903 providing for a bounty of 25 cents a head for hedgehogs. It was contended by the advocates of the bill that the hedgehog was killing off the trees. The legislature after the passage of the bill appropriated \$500 a year for 1903 and 1904 to reimburse the towns paying out these hedgehog bounties, and the town treasurers were expected to pay 25 cents for each nose and

pair of front feet presented. The legislature had very much underestimated the energy of the farmer boys, however, for in 1903 about 60,000 hedgehogs were killed, necessitating the paying out of \$15,000 in bounties and overrunning the appropriation \$14,500, or 2,900 percent. The small towns had to borrow money to pay the bounties and upon this money they had to pay interest and, consequently, there was a great deal of dissatisfaction. It was estimated, also, that where the killing of hedgehogs saved one tree ten were burned down by fires following in the tracks of the hunters.

A Tariff Classification.

Under what provision of a tariff act and at what duty should birch squares, chair stock and sticks, rough sawed, be assessed by the customs collector?

These imports have been passed upon by the board of general appraisers and it was their decision that the items should be placed under the provisions of paragraph 195, which provides for "sawed lumber not specially provided for," and are dutiable at \$2 a thousand feet board measure.

Legal Views of Scant Thicknesses.

Has any legislation ever been passed covering the matter of scant thicknesses?

No. A bill was introduced into the Minnesota state legislature to take effect from and after December 1, 1905, as follows:

Be it enacted by the legislature of the state of Minnesota:

Section 1. No person, company or corporation shall sell or expose for sale within this state any sawed lumber which, in the rough, is not the size and dimension which it purports to be, and lumber dressed or surfaced on one side shall not be more than one-eighth of an inch in thickness and width than the dimension for which it is sold.

Section 2. Any lumber which is not of the thickness, width or length which it purports to be shall be designated "short measure" and may be sold as such.

Section 3. Any person, company or corporation violating any provision of this act shall be guilty of a misdemeanor.

Section 4. This act shall take effect and be in force from and after December 1, 1905.

This bill failed to pass. It was termed "freak legislation"—appropriately so.

Was the Contract Violated?

I made a contract with a mill for 2,000,000 feet of cottonwood lumber, log run, at a certain price a thousand feet board measure. According to the contract the mill had to cut the lumber in dimensions as required by me, provided only standard sizes were required. The mill has been cutting inch, inch and a quarter, inch and a half and two inch and also a certain amount of $\frac{3}{4}$ -inch. I received my invoice for the $\frac{3}{4}$ -inch cottonwood and the mill charges me exactly the same price for it as for the inch stock, which, in my opinion, is not correct.

We contracted to deliver 2,000,000 feet of cottonwood lumber f. o. b. mill for a stipulated price a thousand feet, board measure. After the contract was signed the purchaser ordered 100,000 feet $\frac{3}{4}$ -inch ones and twos, one car of which was shipped and billed out on a basis of face or surface measure. Upon receipt of the bill the purchaser wrote asking for one-fourth reduction. Please give rules which govern in such cases.

Both sides of the controversy are presented and in the main the statements of fact agree. With respect to the order for $\frac{3}{4}$ -inch stock the mill claims it was all to grade first and seconds and as no mention of the quality of the material ordered is made by the producer it is to be presumed that the $\frac{3}{4}$ -inch stock was to consist of the grade specified. If this conclusion is correct the producer was justified in charging for the lumber on a basis of inch or board measurement.

A hardwood producer said he would take an order to

cut $\frac{3}{4}$ -inch stock and charge for it on that basis, provided the customer would agree to take mill run. If, however, a certain grade was demanded not only would he charge full price for thin lumber but an extra consideration would be demanded on account of the difficulty that would be experienced in disposing of the remainder of the lumber.

Right of Railroad to Cut Timber from Public Domain.

Has the supreme court ever defined the rights of a railroad company to cut timber from the public lands along the right of way?

Yes, in the case of the United States versus the St. Anthony Railroad Company, which decision probably will have a bearing on railroad construction in the west.

This suit was filed in behalf of the government against the railroad company, it being alleged that the latter had unlawfully cut and used a certain amount of timber from public lands belonging to the United States government in Idaho.

The railroad company admitted that through its agents it had used timber to the amounts specified but contended that this use was lawful and provided for in the regulations governing the construction of railroads; that the timber was adjacent to the right of way and, being on the public domain, could be used by the railroad company for ties and bridge timbers to the amount necessary for such purposes. Suit was brought in a United States circuit court in Idaho and the complaint dismissed, which decision was affirmed on appeal, a second appeal being taken from the court of appeals to the supreme court.

In the agreed statement of facts the amount of timber alleged by the plaintiff to have been cut, the ownership of the lands from which it was removed and their

character were admitted. It was agreed that there were no other timber lands or suitable timber nearer the railroad than the lands from which the material was secured, and that the lands thus entered were near enough to the railroad to be directly and materially benefited by it.

In the opinion of Justice Peckham, who wrote the decision, the question to be decided was the meaning of the term "adjacent." In a general way it was said that the length of the railroad to be built would have some effect upon the question of the distance the word "adjacent" would permit the builders to go in search of timber—that it must be defined with reference to the context, at least to some extent. The law permitting railroads to be built through public lands gives the company a strip 200 feet wide and the material or timber used should be "adjacent" to this strip.

It was held by Justice Peckham that it surely would be improper so to extend the ordinary and usual meaning of the word as to permit the railroad company to enter upon any land of the government as being adjacent simply because the road wanted the timber. It is not enough that the land from which timber cut will be benefited by the building of the roads—lands hundreds of miles distant might be directly and materially benefited by the construction of a railroad and yet be beyond the utmost extent heretofore supposed to be included in the word "adjacent"—nor does the law grant free license to range the public lands and take timber wherever it may be found or wherever it may by any possibility be taken with profit to the company.

The timber used in this case was cut by an agent of the railroad company, and in the opinion of the court the measure of damage would be the value of the timber at the place where it was cut.

The verdict of the lower courts was reversed and the case remanded back with instruction to enter judgment in favor of the United States for the amount of the timber, 1,682,975 feet, and for its value at the rate of \$1.50 a thousand.

Selling Timber Without Removal Time Limit.

In the deeds to land in which the timber is reserved without specification as to the time within which it should be removed, what limit will the courts place upon the rights of the holder of such timber reservation?

The Supreme Court of Michigan has decided in a case similar to that outlined that the reservation includes only such timber as was merchantable at the time the deed was made and that the same must be removed within a reasonable time after notice has been given to the grantee by the grantor that the latter wishes the removal made.

Railroad Grants in Forest Reserves.

Where a railroad company has been granted alternate sections of land by the United States government, how would such grants be affected by the inclusion of such sections within a forest reservation?

Formerly under the lieu land selection law it was possible for holders of lands within a forest reservation to exchange them for any other area of equal acreage belonging to the government outside of its forest reserves. March 4, 1905, however, the fifty-eighth Congress repealed the lieu land selection provision of the general land laws, taking away this right, and this repeal would affect railroad land holders as well as private individuals or corporations. When the San Francisco Mountain reserve was set aside, a special contract was made between the secretary of the interior

and the Santa Fe railroad system which provided for the surrender of the alternate sections owned by the railroad and for the selection of other lands included in the public domain. This, however, was a special act, which had been authorized by Congress.

The Reciprocity Treaty With Canada.

What was the reciprocity treaty between the United States and Canada?

About the middle of the nineteenth century there was a great increase in the demand on the American side of the boundary for Ontario timber and in 1854 the trade received a great impetus through the signing of a reciprocity treaty between the United States and Canada, June 5 of that year, to take effect March 16, 1855. This treaty provided for the free exchange of natural products between the two countries and affected "timber and lumber of all kinds, rough, hewed and sawed, manufactured in whole or in part." The treaty was abrogated in 1866, which act was followed by the reimposition by the Ontario government of its export duties on logs.

Arkansas Timber Holders Protected.

Has Arkansas a law formed for the protection of owners of timber in the state?

There is a law in Arkansas which was passed March 17, 1883, as "an act to protect state lands and for the regulation and protection of the timber and timber interests of the state." Under this provision it is declared to be a felony to enter upon any land belonging to the state or any corporation or individual and to cut down or destroy timber to or beyond the value of \$10 or to carry away timber, staves or shingles of

like value. The penalty fixed for such an offense is two years in the penitentiary at hard labor. Persons who aid or abet in selling stolen timber are made jointly and severally liable to the owner in double the value of the property stolen, to be recovered by action at law in the name of the corporation or of the individual owning the land. The law also provides for the appointment of a state timber inspector. At the request of an owner of timber, logs or lumber, this official is required to scale or measure the same, furnishing a certificate of contents which will be considered presumptive evidence in any of the courts of the state. In such certificate the log contents are based upon Scribner measurement, this being recognized by the state. Other systems of log measurement may be used at the request of the owner, but where they are so used the fact must be mentioned in the certificate. This timber law also provides for the registration of log marks and attaches a penalty of \$10 for the improper use of such marks. The fees of the state timber inspector are 5 cents a thousand for scaling or measuring and furnishing survey bills of logs, 12 cents a thousand running measure for measuring square timber, 10 cents a thousand for sawed lumber, including bills; 50 cents each for recording log marks. For recording mortgages and other instruments his fees correspond to those of the register of deeds.

Divisions of Through Freight with Industrial Lines.

Are divisions with industrial lines lawful?

Not under the new law. Even under the old regulations where the industrial line comprised a part of the manufacturing facilities the commission held that a di-

vision of the through rate could not be allowed; that in effect such division would be a rebate to the favored shipper.

Many of these industrial lines are so constructed and operated that it is impossible for them to perform the service of a common carrier. It was mainly for this reason that the commission made what might be termed an exception in deciding the "tap line" case. Logging roads are so constructed and operated that they are able to and most of them do perform the service of a common carrier.

The commissioners held that a railroad company may or may not perform a switching service over private lines, but that where such service is rendered by the shipper no allowance may be made.

PART II.—RETAIL.

THE RETAIL YARD.

Diversified Stocks.

Should a retailer keep in stock more kinds of wood than are absolutely necessary to supply the wants of his trade?

No man ever made a success by picayunish business methods—that is to say, where he was forced to meet competition. Dealers should not only supply the wants of their trade, but should be on the alert and able and willing to educate their trade in the use of woods to which it has not been accustomed when they know that such woods will answer the purpose for which they are selling them and prove profitable stock.

Long Time Accounts.

In long running accounts what is the best method to pursue in order that the customer may not get the idea that he is being charged for items which he did not buy?

There are several ways in which this can be done. Some dealers make duplicate invoices or bills for every item that is sent out, sending or giving the original to the purchaser and filing the duplicate, then when the account is due they take the buyer into the office and check up the items on the bill with these separate memoranda. Others send out statements at

certain fixed periods, which statements bear across the top in bold type the significant phrase, "Keep this for reference." There is urged against these statements, however, the theory that this constant reminding of the customer of the amount he owes is likely to check his buying, whereas, if he were not regularly confronted with the amount of his indebtedness he would be more likely to think of what he would like in the way of building or improvement work than its cost. Of course it is better to leave the stock in the yard than to sell to a man who may not be able to pay for it, but on the other hand there are a great many who are able to pay but who would be unwilling to supply their wants if they were constantly reminded of how much it was costing them.

Throwing Off Odd Change.

When a customer calls to settle a bill which runs a few cents over the even dollar, does it pay to throw off the odd change?

This is a question about which there is a great difference of opinion. Probably it depends largely upon the class of customers and the size of the town in which the business is being done. In a small town where the customers come into direct contact with the proprietor of the business they come to expect special consideration which they do not look for if doing business with the agent of a large concern, the owner of which they do not see at all.

In what may be called direct contact business probably throwing off the odd cents is good policy. It gives the customer the idea that he is being given special consideration, which is always gratifying to his vanity. The total of such rebates will not amount

to much at the end of the year and probably will be more than made up for by the increased business which it will bring.

What Is Gained by Reading Trade Papers.

Should a retailer or retail yard manager read the current lumber news?

There is an old adage which has lost nothing of virtue through age, that "nothing succeeds like success." A great majority of successful retail dealers in the United States take some lumber journal and read it thoroughly. Many line yard concerns now subscribe for sufficient copies to permit each yard manager to have one sent to him individually. They act on the theory that a man can not know too much about his business and that a journal which employs the services of a hundred representatives scattered all over the country, whose editors are men who have made a business of looking at the lumber business from an entirely unprejudiced standpoint for years, must necessarily contain information of value which the individual retailer would be unable to secure for himself even had he the time to devote to its gathering. A strong instance of how thoroughly some of the retail yard owners appreciate the value of the constant study of the business as it is portrayed in the lumber newspapers is evidenced by the action of a certain line yard concern in the northwest. The company operates twenty-five or more yards and subscribes for an equal number of copies of the *AMERICAN LUMBERMAN*, which are sent to the managers of these yards. The company's auditor, on one of his visits, found at one of the yards several copies of the paper, from which the wrappers

had not been removed! The yard manager was immediately discharged.

Selling Farm Implements.

Does it pay a retailer to sell farm implements?

Selling implements is not at all general among retailers, but such lines are handled in some cases, especially in very small country towns. The dealers who sell farm machinery claim they do so more because it brings them closer in touch with the farmers and enables them to keep a line on the building probabilities than for the direct profit there is on machinery.

How to Check Deliveries.

What is the best way of checking a long account?

In addition to ordinary bookkeeping probably the best method is to use a duplicate receipt book. Insist upon the customer signing a ticket at the time each delivery is made, which receipt will state in detail the items, amounts and total. The duplicates will remain in the book or be transferred to a file and in the event of any question being raised regarding the amount of the final bill when rendered these receipts, when checked with the day book and ledger, will convince any reasonable man of the correctness of the account. A long term account, covering a number of small purchases, is almost always underestimated by the buyer, and upon being confronted with the bill he is likely to think some mistake has been made. Evidence such as indicated above will ease his mind as to the correctness of the account and possibly the result will be that instead of taking his business elsewhere under the impression that his bill was more than it should have been he will remain a good customer of the yard.

Loaning Lumber.

Should a retailer loan lumber?

This is a question with a great many sides. If he does loan the lumber he is going to lose something when he comes to sell it and if he does not he is going to lose some friends. As a rule a retailer is called upon for lumber by promoters of the county fair, church fair or political meetings and the borrowers apparently think that a few nail holes, split ends and discolorations will not detract from the intrinsic worth of the lumber, although the same people undoubtedly would be aggrieved if asked to pay full price for such material. Many lumbermen think that a good rule to make in this connection is to loan lumber where it is to be used inside—as for benches, tables etc., but to draw the line at free use when it comes to outside work, where the boards are likely to be injured by the weather.

How to Get Good Drivers.

What kind of a man should be employed to drive a delivery team?

The only way to get a good man for a retail yard team is to hire one who gives a good account of himself and if he does not fill the bill discharge him and try again. Possibly the best way to tell a good driver is by the things he does not do. No man is fit to drive a team who tries to break a speed record taking a load of lumber through sand, mud, up grade or over cobble stones; who attempts to start a loaded team by hitting the off horse over the head with a whip and then getting out and kicking him if the team doesn't pull together and start the load; who takes pride in seeing how much of a load he can pile on without

stalling the team or having a breakdown; who works his horses until they are covered with sweat, then leaves them standing in a cold wind while he goes off to visit a friend down the street; or one who wants to clip his horses in winter to save work with the curry comb.

Does It Pay to Keep Complete Stocks?

Should a retail dealer keep a complete stock?

If he intends to get the business naturally tributary to his yard he certainly should. When a customer is in a hurry to put up a building or needs lumber in a rush for any other purpose, it is exceedingly annoying to be told he cannot have it at once. It is likely to make him go somewhere else the next time he wants to buy, even if "somewhere else" means another town.

Cash Business in Retail Trade.

Should a retail lumber dealer endeavor to do a strictly cash business?

It is practically impossible to conduct a retail lumber business successfully upon an absolutely cash basis. The most valuable asset to any business man is the good will of his customers and to exact payment of a contractor before the lumber reaches the site of his operations would in many cases cause the dealer to lose this important factor in the successful conduct of his business. But while a retail lumberman must, from the very nature of his business, extend credit, it is unnecessary that he fill his books with bad accounts. If it is true that a dealer can hardly hope for success if he refuses credit to every one, it is equally true he has no hope at all if he re-

fuses credit to no one. Possibly it is a good rule for a dealer to look upon his stock as so much cash and when a man asks for credit to decide whether or not he can afford to loan him so much of his money. It is better to lose a sale involving a profit of \$25 than it is to lose \$125 worth of lumber.

How to Get Close to the Farmer.

What is the best way for the retailer in a small town to get close to the trade of the farmers?

There are various ways by which this can be done. Some dealers write periodic letters addressing them to all the farmers in the section tributary to their town. Others send out postal card inquiries, insert suggestive advertisements in the local paper etc. and use various other advertising methods. These are all good, but if the dealer has some spare time he can do a little missionary work out in the farming districts that will cost nothing and probably return even better results. That is simply by getting out and visiting among the farmers. He might take a shotgun along with him as an excuse and make it a point to drop in on any one who looks like a possible customer. It is often possible to suggest something in the way of an addition to the barn, new fence or the like which suggestion would bear fruit in the shape of a nice little order for the material.

Best Yard Location.

What is the best location for a yard?

This is a question that is mighty important to the man who is about to invest his money in a new town. It is also a question that has a good many sides and

that can not be answered positively. If land is purchased on or near the railroad there are two distinct advantages gained; the first cost is small, land along the track being cheap as compared with a location of equal size on one of the business streets of the town. There is also considerable saving in handling the lumber. If the land is right on the track the lumber can be unloaded from the car track onto the yard or if it is a little too far away for this, a spur track can be run at not a great expense and by that way the item of hauling eliminated. This, of course, means a material saving, for where lumber has to be hauled from the car to a central position somewhere in the middle of town it means the employment of men and teams, which is another word for expense. Therefore, it is plain that operating along the railroad track is considerably cheaper than at the more central locations.

On the other hand the man who is up town has the advantage of having his yard and stock in a location which people are forced to pass every day and naturally will get a great deal more business than he would if he were out of sight. That, of course, only applies to a town where there are two or more yards. In a one yard town if a man wants to buy lumber he has to go to the owner of that one yard, no matter where he happens to be located, but in a town where competition is a factor a man whose yard is way off on the outskirts of town stands a poor show compared with the one who is on the main street. A general rule may be made, therefore, that in a town where there are two or more yards it hardly would pay a man to operate along the railroad track—if he does not get business reduced operating expenses will do him little good.

Piece Sales or "Driblet Trade."

Is it worth the retailer's time to encourage what might be called "driblet trade" or is it more trouble than it is worth?

While it takes more time and trouble to sell 5,000 feet of lumber in little bits than on a single order, there is considerably more money in doing it that way. When a man is figuring on buying a big bill of goods he will haggle and dicker to get the price down to the lowest possible notch, but on the small purchases he does not stop to squabble for a few cents. Also he is willing to pay a little something extra because he knows he is putting the dealer to considerable trouble to wait on him. The uptodate retailer knows this. At the end of the year footing up the "driblet" business usually shows a neat profit.

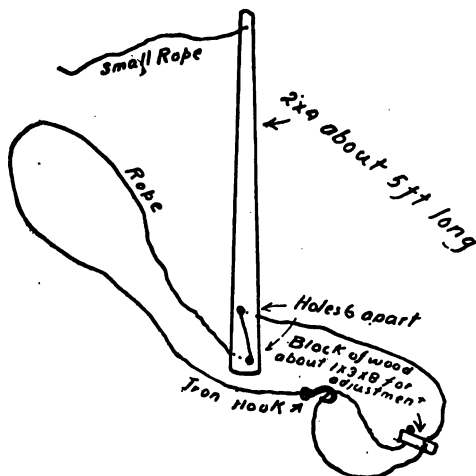
Load Binders.

What is the best means of binding on a load of lumber?

There are a number of good binders in use, but probably none more thoroughly satisfactory than the following:

A cross piece which is to be placed beneath the load is furnished with chains at either end whose lengths are equal and will permit of the top links coming up to within about a foot of the top of the load. Another cross piece corresponding to the first, with holes bored through the ends, through which extend threaded iron rods hooked at the ends, which hooks extend down to meet the chains attached to the lower cross pieces. The piece to which the chains are attached is secured permanently in place beneath the bed of the wagon, the chains being permitted to dangle on the ground. After the load has been placed in position

these chains are fastened on the hooks extending through the cross piece which now runs across the top of the load. Over the ends of the threaded rods protruding through this top cross piece, handles with threaded holes corresponding to the threads on the rods are placed and after linking the chain links to the hoops the binding of the load resolves itself into



LOAD BINDER.

the simple matter of twisting the handles and thus screwing down the top cross piece. The chains are of sufficient length to permit of the highest load which it may be desirable to place on the wagon being bound and when it is used for a small load the hooks are made to engage correspondingly lower links.

The accompanying illustration is that of a binder which is said to be effective and possesses the advan-

tage of simplicity and cheapness. If it should happen that the dealer furnish his customer with one of these binders and not have it returned to him, he would not be very much out on the transaction.

Handy Ladders.

What is the best kind of a ladder for connecting an alley or ground floor with the second story of the shed?

A simple device which has proved effective is what may be called a balance swinging ladder. Take an ordinary ladder, which, when standing straight up will extend from the ground or first floor to the required height above the second floor and weight the top of it so that the part of the ladder above the second floor will be as heavy as the longer part which extends between the second floor and the first. Across the standards, at a distance from the base which will bring it parallel with the second floor, a cleat is nailed through which a hole has been bored to connect with a bolt which has been driven through one of the studs supporting the second floor. When the ladder has been hung upon this bolt, a nut should be screwed on the end of the bolt to hold the ladder securely in place. When the ladder is not in use the lower end may be pushed up until it is on a level with the second floor, in which position it is entirely out of the way. When it is necessary to use it again, it is but the work of a moment to pull it down into place.

Shed Gutters.

Does a shed gutter pay and if so what is the best kind of shed gutter?

Tin gutters are expensive and are not long lived, as they soon sag and allow the water to overflow.

Wooden gutters are more satisfactory. Where patented roofing material is used a simple and effective gutter may be made by nailing a 2x4 edgewise on the eaves and simply having the roofing nailed over it. To have no gutter at all is extremely foolish. Sheds are built to protect lumber from the weather, especially the rain, and if there is no gutter on the roof the latter precipitates a great amount of water directly under the eaves, with the result that it is only a short time before the ground is so washed away that the shed is practically undermined and the rain simply falls from the roof and flows under the lumber piled in the shed.

Significance of Clean Office.

Does it pay to keep an office clean and in shipshape order?

It is impossible to have a lack of system in one part of a business without its effect being shown in other departments, and if system and cleanliness pay in the yard they certainly will pay in the office. It is in the office that a customer is brought when he is figuring on placing a bill of lumber. It is the appearance of the office which will impress him favorably or unfavorably regarding the businesslike methods of the proprietor. If a man who wants to build a house in a hurry goes into a lumber office to figure on a bill, and finds the floor littered with old papers and the two last months' sheets of the calendar still hanging on the hook, it will impress him as a poor augury for promptness in handling orders. Then again, a sloppy looking office does not indicate prosperity, and nothing so inspires confidence in an intending patron as an appearance of prosperity. Prosperity naturally follows good uptodate business

methods, and that is what the ordinary man is looking for and expects to find when he places his order.

Carting Lumber Over Rough Roads.

When lumber has to be hauled in a district where many of the roads run around steep hillsides is there any way of balancing the load to prevent it from overturning?

One of the most difficult places to haul lumber because of these side grades is Cripple Creek, Colo., and the method there used to keep the load on the wagon and the wagon on the road is probably as simple and effective as any which could be devised. The teamster carries a long plank with him and when he comes to one of these steep side grades, he puts the end of the plank between the ridge pole and the wagon bed with the free end pointing up the hill and then sits or stands on this end of the plank until the dangerous point has been passed. His weight with this leverage is sufficient to maintain a balance, where without it the whole outfit might be scattered at the bottom of the hill.

Starting a Retail Yard.

I expect to engage in the retail lumber business sooner or later and beg to ask you what kind of a showing I can make with about \$5,000, not including real estate in this amount. I have never been in the lumber business hence this question to you.

A capital of \$5,000 should be ample to launch a retail lumber business in a small town, providing it was all available for use in the business. The capital necessary naturally would be contingent to a considerable extent upon the length of credit which the dealer would have to grant his customers. If he could

secure prompt settlement for all material sold he should have no difficulty in laying in a supply sufficient to fill the ordinary requirements of his trade and could, when large amounts of material were desired for one bill, have shipped in a quantity of certain items of which heavy stocks were not ordinarily carried. If the correspondent is unacquainted with the lumber business it would probably be wise to consult a contractor, builder or, if possible, a retail dealer as to the items which should be included in the initial stock order. The amount invested in the first instance should not comprise more than from one-half to three-fifths of the available capital, as it is practically impossible to determine in advance the kinds and sizes of stock that will be demanded in largest amounts, and regardless of the care exercised in making selections a considerable part of the original purchases will remain on hand for some time.

The first purchase should be made on a cash basis and an understanding secured with certain responsible manufacturers or wholesalers whereby when necessary a line of credit compatible with the beginner's standing could be secured, and it will be necessary to have this at times when collections are slow or the dealer has been disappointed in securing payment of certain bills. Keeping in reserve half of the capital stock will tide the beginner over the first few months, but it is not sufficient to permit him to grant heavy lines of credit among his customers. The first year the yard is in existence will require close attention to details and the exercise of economy in conducting the business in order that the dealer may get his affairs well in hand and learn the ropes.

While the lumber business is not a sealed book and

while lumbermen are not members of a secret society, still there is much to the industry that is peculiar to itself and much to be learned in buying as well as in selling, and when starting in to retail lumber the beginner should go slow and lay a solid foundation.

Inventory as Basis of Fire Loss.

Referring to the speech of John W. Barry, president Northwestern Lumbermen's Association, printed on page 34 of your issue of February 13, 1904, we would like to know if Mr. Barry is right; and would dealers who inventory low in order to have a margin to work on be obliged to settle a fire loss on prices as inventoried.

Without question Mr. Barry was right when he described how adjusters arrive at a lumber fire loss. He said that to the total of the last inventory are added the total receipts since the date of the inventory, as shown by invoices and books, and sometimes by books at the freight office. From this grand total are deducted the sales since the date of last inventory, less an agreed percent of profits; the amount of undamaged stock at current market prices, and the amount of damaged stock at agreed prices. The difference is the fire loss. This being the case, if the inventory is lower than the actual value of the lumber of course the dealer will lose by the amount he has undervalued his stock. There does not seem to be anything further to say on the insurance side of the question.

Each inventory of yard stock made by a retail concern is a contingent sale to the insurance companies on the basis of the prices and quantities set down in such inventory. If a yard is inventoried \$500 below what it would cost to replace the stock that \$500, in case of a total fire loss, is given outright to the insurance companies, and in a case of a partial loss a pro-

portionate part of the \$500 is given to the insurance companies.

Some dealers are in the habit of making what they call bed-rock estimates of the value of their stock in order to be on the safe side in the final outcome. It is thought by such that if they inventory their lumber a percentage below the prices that they would be required to pay were they to replace the lumber they are fortifying themselves against any possible loss that may arise in selling or purchasing.

This course is an unwise one, especially on the insurance side of the question, for if a loss by fire should occur the adjuster will demand to see the last inventory in establishing a basis of loss, and, that showing a shrinkage on the cost value of the lumber, the dealer will be out that much of the shrinkage when the insurance companies settle with him.

How to Handle the Yard Manager.

How may line yard owners increase the efficiency of the local managers of their yards?

Presuming, of course, that ordinary care in the selection of the men and watchfulness over them has been exercised, it follows that the only way to increase the efficiency of the men at the selling end of the business is to give them something to work for in the way of an interest in the business. This policy has been tried and found to be very satisfactory in its results. The yard managers concerned in the experiment were given a certain amount of stock in the concern, the same in some cases being paid for out of the company's dividends and in others out of the salaries of the men. It is only natural that if the man who is selling a bill of lumber can see that he will make a direct profit he

will exert more energy to have his sales foot up as high as possible than he would if it made no difference to him whether business was good or not so long as he could hold his position.

Labor in Retail Yards.

It is customary in Philadelphia to pay for yard labor by the hour, day or week as the case may be, irrespective of the quantity of work performed, except so far as the fear may exist upon the part of the employee of losing his job should his services, for any reason, become unsatisfactory to his employer. Under such a method there can exist no special incentive to the best individual effort possible to each employee. Each employee does not feel that it is to his individual interest to do his best all the time. It might be different were the plan reversed or the amount of wages be made to depend upon the amount of work actually performed by each employee; in other words, some form of piece work, as that term is understood by many manufacturers. It would be interesting to know whether any retail lumberman has thought out or, better, has put in actual practice any plan of this kind and if so to see a description of the plan adopted.

Probably no employer would object, but upon the contrary would gladly pay his employees higher wages provided an equivalent would surely be received for the amount of work actually performed. It is probably true that the more valuable employees would welcome an opportunity to obtain more wages by gladly doing more work in a given time, if assured that additional remuneration would surely result for the added effort involved.

Assuming that this disposition exists on both sides, it may be possible to conceive of some plan that will accomplish the desired results.

Such a plan for economizing labor might work where there were no labor unions, but in case the hands in the yards were under union control the scheme would not be easily worked. Certain hours for a day's work and certain wages therefor, and all

timed and paid alike, is what the unions demand. Even if piece work were submitted to, all would have to do the same stint, no one being allowed to overdo the others. Moreover, the rate of pay would be determined by the union, while the proprietor would have little to say about it.

Profiting by Knowledge of the Market.

Do advancing prices help the retail dealer and, if so, how?

Such a thing is possible. It certainly is possible for him to avoid loss, but to do even the latter he must be a good buyer. To be a good buyer does not mean simply that he should understand what a bargain is when a salesman offers it to him. It means that in the first place he should understand the needs of his trade and the stock that it is likely to buy. In the second place it means that he must keep himself in touch with present and past market conditions and thus be able to gauge with accuracy the trend of future prices. This is not extremely difficult to do. In the lumber business, possibly more than in any other, are certain unquestionable signs which indicate whether the market will rise or fall. Accurately interpreting these signs, he should have no difficulty in keeping his stock in such condition that when the advances come he can raise his own prices correspondingly and therefore make a larger profit margin on the stock that he purchased prior to the raise than he would have made on that stock had no raise occurred. The only markets that a retail lumberman should lose money on are a market which rises for a certain length of time and then falls, forcing him in following

it down, if such a course is necessary, and to sell at a disadvantage the stock which he had purchased on a higher wholesale schedule, or a steadily falling market which in its results would be the same as, in order to do business, the dealer is compelled to keep quite an amount of stock in his yard and if prices were steadily going down, naturally he would sell at a disadvantage so far as his back stock was concerned. But so far as making money on advances is concerned that altogether depends upon local conditions. The dealer may have had the foresight to put in a big stock of lumber just before a marked raise and exercised the good judgment of advancing his prices proportionally with the increase in wholesale values and still not make money on his stock for the reason that the higher prices would discourage building and materially restrict his trade, so that while he might make a greater profit margin on what he sold, still his balance at the end of the season would be smaller than it would have been had the advance not taken place.

CARE OF RETAIL STOCK.

How to Light Storerooms.

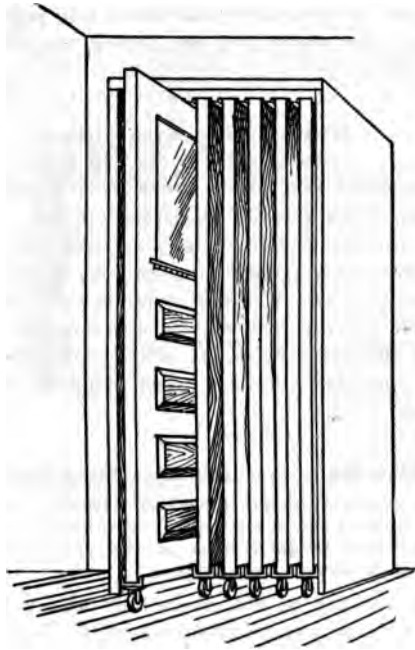
Should the warehouse in the lumber yard be lighted by windows?

If doors carried in stock are constantly exposed to the light they will yellow so badly as in many instances to be unsalable. The proper way is to have the wareroom dark but wired with electric lights, so that when it is necessary to go in there, it may be lighted up as brightly as desirable.

Device for Showing Doors.

What is a good device for showing doors?

There are a number of ways in which doors can be racked so as to be shown advantageously to pros-



CARE OF DOORS.

pective customers. The one illustrated herewith is simple and at the same time answers all purposes. It is an oblong box, the length of the doors, which stands on end open side out. On the floor of this box

are smaller boxes running on trunk rollers. The number of these is regulated by the number of doors to be put in the rack. On the face of the top of the box a cleat is nailed with pieces cut out of the edge to correspond with the width of the door. The latter are simply set in these boxes and rolled into place in the big box, from which they are pulled out as occasion may require.

How to Make Even Piles.

How may lumber be piled so that the sides present an even appearance with regular spaces between the piles?

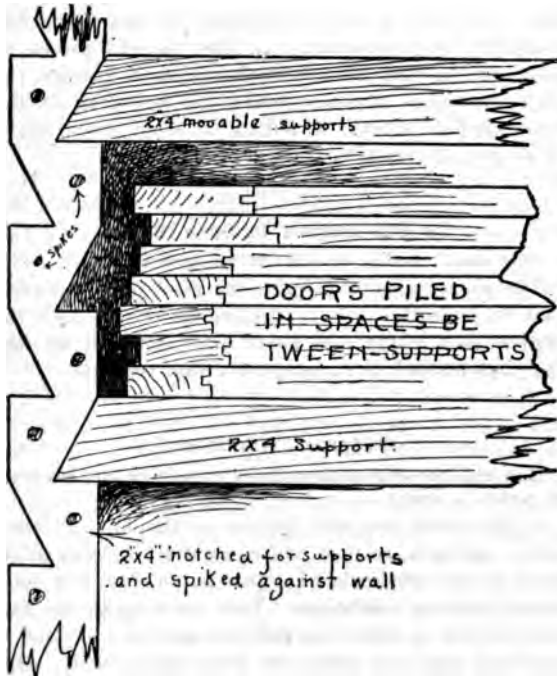
A simple manner of accomplishing this desirable result is to set a couple of 2x4's between the piles and shove the boards against them on both sides until the pile has been raised to the required height, when the dimension may be removed and the sides of the piles will be absolutely even. It is impossible to get the boards absolutely uniform when judging wholly by the eye.

Plan for a Sash and Door Stock Room.

What plan of arranging would you advise for a sash and door stock room for a retail yard where shed room is limited? We have bought a stock of sash and doors and are puzzled as to how to keep them.

Much depends on the amount of money the yard man is willing to spend in fitting up his sash and door wareroom and a great deal also on the amount of stock that is to be carried. Stock doors should be kept in a pile. This method has a number of advantages to recommend it. It saves room and keeps the stock clean and bright and free from damage. It also prevents the doors from warping. A light frame

covered with paper and laid on top of a pile of doots will keep the one that otherwise would be exposed from blackening and accumulating a load of dust. Where a large stock is carried, however, the question



PLAN FOR SASH AND DOOR RACKS.

of room is one to be considered. This question is solved by the application of the method set forth in the accompanying engraving. When a rack such as

that shown is used a number of different sized doors can be placed in the racks, thus saving a great deal of room and making it possible to get at any size wanted without trouble. Sufficient detail for building the rack is shown and while there is nothing absolutely original about the idea it has the elements of simplicity and cheapness to recommend it. The upright pieces in which the notches are cut can be made of 2x4 and the cross pieces or movable pieces can be made of the same kind of stock. A button or some other means of keeping the crossbar in place can be used.

To Pile Lumber in Open Sheds.

How should lumber be piled in an open shed?

The proper way is to have the piles pitch outward, that is, have the ends in the middle of the shed the higher, then if the rain beats in, it will run off into the yard instead of running pack into the pile.

Dustproof Warerooms.

How may the dust be kept out of a room or bin, the front of which is open?

If the walls, top and bottom of the bin are absolutely air tight, no dust will enter the bin, even if the front is entirely unclosed. That is, no dust will enter under ordinary conditions. This is owing to the fact that the bin is full of air and this acts as a cushion in repelling the dust laden air from the outside. The pressure within outward is as great as the air pressure without inward. It is even asserted that when the wind is blowing with considerable velocity toward the opening in the bin the air will not enter, but this probably is an exaggeration. However, if the bin

is air tight except the doorway, very little air will enter under normal conditions and consequently the door may be left open while lumber or molding is being put in or taken out without their being covered with dust as ordinarily would be the case.

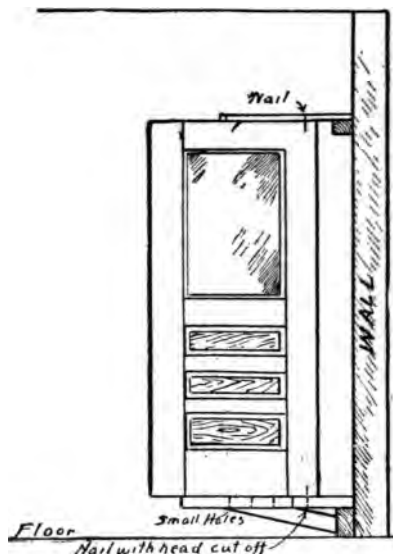
Doors; How Displayed.

What is the best way to arrange doors so that they may be inspected by the intending purchaser without inconvenience to either himself or the retailer?

Take two pieces of inch boards of a length which will suffice for the number of doors you wish to show. Fasten them both securely to the wall, one above the other, at a distance corresponding to the height of the doors, the low piece a short distance above the floor. Through both of these pieces have small holes bored, say four inches apart, and drive a nail into the top of the door a couple of inches from the hinge edge. So place the door that the nail, which should project out about an inch, fits into one of the holes in the upper piece which is fastened to the wall. The end of the door will then rest on the lower piece and through the corresponding hole in the lower piece another nail should be driven into the door. The door then can be swung out at right angles to the pieces from which it hangs and other doors placed in similar positions in equal numbers to the holes. Half a dozen doors can be hung by this one contrivance. The doors will turn readily after the manner of leaves in a book and the prospective customer can examine them and see how they compare one with the other without the slightest difficulty.

Instead of driving nails into the bottom sill a shoe may be used, which is made by bending a piece of

hoop iron two inches wide and nine inches long around a block of wood one and one-half inches square and three and one-half inches long and driving two screws through the hoop iron and into the block. In the bottom of the block a hole is bored and a piece of gas



DOORS DISPLAYED TO ADVANTAGE.

pipe half an inch in diameter and three inches long is inserted. Then holes large enough to admit of this gas pipe turning in them are bored in the bottom sill which allows the shoe, with the door resting on it, to turn. Twenty-five of these shoes may be made for \$1.

Another plan for hanging doors so that they may be readily and easily exhibited to the trade is to nail

a strip of 1x2 or other small dimension at the required hight from the floor and into this device drive a number of screw hooks. Directly underneath this strip nail another one to the floor. Then on the inner edge of the doors intended for exhibition put screw eyes, at a hight which will allow the same to be placed over the hooks in the upper strip, the bottom of the door to rest on the strip which is nailed to the floor and wall. The doors then may be swung flat to either wall or at right angles to the wall—in fact, are as convenient for inspection as though hung on hinges.

To Keep Piles from Toppling.

When three or four piles of lumber are put into one bin and the middle pile or piles are apt to be moved, the outside piles are very likely to get out of plumb and fall into the empty center. What is the simplest device to prevent this?

If the foundations or floors of the bins are curved so as to be highest in the center it will be found that if the piles shift at all, they will lean against the partitions and being unable to go any further will not fall.

Neat Appearing Yards Pay.

Does it pay to exercise care in the arrangement of yard stock, wholesale and retail?

There is a great difference in the arrangement of stock in a yard and this difference often means many dollars in or out of the pocket of the owner. In some cases the stock is scattered over about half the township and piled in little heaps exposed to the sun, the top piece never turned over, with the result that a considerable percentage is so badly warped that it is unsalable without a considerable shade being made on

the price. On the other hand there are yards where an immense amount of lumber is piled in a very small space and yet so kept that any item in stock may be readily obtained when wanted. It takes little more time to keep a stock of lumber in good ship shape order than it does to slam it around all over the yard and have a lot of warped, split, broken and generally unsalable boards on your hands at the end of the season. And besides actual loss in stock there is always a loss in trade, for an intending customer can not help being pleased at the sight of a nice stock of lumber well and neatly kept. While for the same reasons a sloppy yard will tend to lower the yard man in the estimation of his customers.

Keep Gates and Doors in Working Order.

Does it pay to keep yard gates and shed doors in working order?

The subjects of gates and doors are important to the retail yard man although not always given the amount of consideration due them. The number of yards where the hinges have rusted off the gate and the latter is reclining peacefully up against the fence with the weeds twining around about the second board is alarming to contemplate. The supposition is that when a man puts a gate on his yard it is with the idea that he can close the same when he gets ready to go home for the night and thus possibly keep out tramps, stray dogs, homeless cows etc. But one hinge comes off, the gate sinks down, he doesn't get around to fix it and the yard manages to get along just the same, so finally when the other hinge gives way, he picks it up tenderly, and carries it away for kindling wood or stands it up back of the barn. In about nine

cases out of ten, also, the shed door is neither a thing of beauty nor a very useful piece of furniture. Most of them are hinge doors that swing outward, consequently take up a lot of room and either blow open when you want them closed or else blow shut when you want them open. If you happen to be in the shed when it is raining, you have to go outside and get wet in order to close the door. The model door for the shed is a single door that runs on hanging rollers. It can be opened and closed from either outside or inside with little or no effort and it does not sink down so that you have to lift one end as is the case with the ordinary hinge doors. Double rolling doors are the next best thing but you have to have a base for the bottoms to meet on and the good purpose it served in that way is more than offset by the fact that you usually fall over it three times out of four when you are going in or out.

Disposition of Broken Stock.

What is the best disposition to make of broken lath and lumber which accumulate in the retail yard?

It would seem that about the only way to get any returns from this waste material would be to have a scrap heap and instruct the yard man to throw all boards so badly warped or split as to be useless, as well as broken lath etc., into this pile, then on rainy days or other days when there is little or nothing to do the accumulation might be chopped into kindling wood and the latter tied up into bundles and sold, thus avoiding a dead loss. Another good result from this system, and perhaps the most important one, would be the fact that the yard would be kept clean and neat.

How to Utilize Blackened Timber.

What is the best way to dispose of lumber which has become old and dingy looking and therefore is not readily salable?

Where the yard is large enough to make it practicable, this stock might be utilized by the owner in cleaning up the yard once a year and building a house with it. In many respects it is better than bright lumber, being thoroughly seasoned, but buyers do not so consider it and to sell it prices might have to be shaded considerably.

Care in Piling Lumber.

Does it pay to exercise care in piling lumber?

Careless piling of lumber results in ragged looking piles, which in turn have the effect of making a yard look unprosperous and sloppy. Such an appearance is bound to leave a bad impression upon the visiting customer and is not a good advertisement for the business.

How to Keep Molding.

What is the proper way to keep molding?

Molding is one of the finer mill products and it costs considerable money, taking into consideration the amount of lumber, yet in a large percentage of the yards it is given little more care than is the ordinary lumber. Molding should be kept in racks that are enclosed in such a manner as to keep out the dirt. Some retailers go to the extreme of wrapping their molding in heavy paper with the exception of a few pieces which they use as samples. This probably is carrying the matter a little farther than is necessary, as it is not a difficult matter to have the rack so

located that the dust and dirt will not blow in on the molding.

Molding Racks.

Is there any way of building a molding rack so that thin molding will go where it is put and not twist around into another box or get wrapped around other pieces?

If the racks are lined with some thin material that will serve as a guide for the molding it can be shoved into place without difficulty. Almost anything will do for this lining, and it does not take much work to put it in place and will result in saving the yard man considerable labor and in keeping his stock in much better shape.

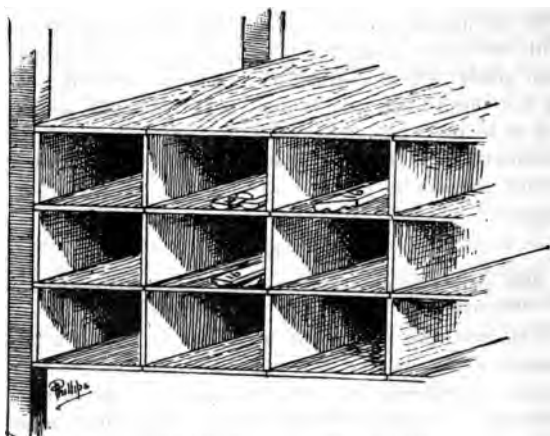
Care of Molding.

Why should moldings receive such exceptionally good care as compared with other items of stock carried?

The retailing of lumber would be a sorry business financially if in the average yard the entire stock should deteriorate in value as does the one item of molding. To such an extent is this deterioration permitted that not infrequently, when a yard changes hands, the purchaser objects to inventorying the molding at any price.

There are several reasons why molding should be kept in a dark, tight rack—and a rack that is partially tight does not answer the purpose. Dust, one of the invidious foes of the retail lumberman, sifts through small crevices, hence a molding rack, unless it be dust proof, falls short of the requirements. It is claimed by those who store molding on end that it is decidedly the best way, one advantage being that if dust collects on the sticks light blows on them will

cause it to fall off. Even if occasionally shaken off, however, there is more or less dust that will cling to the surface, finding a lodging place in the grain and pores of the wood. The only right way is that the rack be dustproof, the taste of the dealer deciding



APPROVED MOLDING RACK.

whether the molding be set on end or laid lengthwise.

It is only of late years that it has been thought necessary to have a dark room, or even a dark rack, in connection with a retail yard, no consideration being given to the fact that the properties of natural light cause the discoloration of woods. The lighter the wareroom the better, it was thought, and the more windows there were in it the sooner the doors and other mill work lost their fresh appearance and took on a yellow cast that was objectionable to the

customer. Dark store rooms are a feature of up-to-date yards, the decided advantage of which can be made plain to the purchaser. When inside painting was in vogue it was less necessary that molding be kept away from the light and dust. How much the natural color of the wood was changed did not matter, as it was to be painted, and if the surface had become rough from the adhering of dust a piece of sand paper run over it would put it in shape for the painter's brush.

The expense of building a dark, dustproof molding rack is small when compared with its worth, as by its use the molding retains its original value and the customer leaves the yard feeling that he has been offered fresh, salable goods.

RETAIL MISCELLANY.

Does It Pay to Keep Posted?

Does it pay the retailer to keep himself informed on conditions affecting the manufacturing end of the business?

A retailer should trim his sails (sales) to meet the varying commercial winds. A dealer who keeps posted on conditions can get an inkling of which way a rate is going to jump as regards lumber prices and buy or sell to meet the coming change. A man who reads no lumber paper and attends no association meetings naturally knows nothing about the probabilities of future prices and has to jog along and take things as they come without a chance to profit by conditions which are foretold if he would but listen.

Coöperative Yards.

Is a coöperative yard serious competition to regular retail dealers and if so why?

Properly managed the coöperative or farmers' yard is competition which the regular retail lumberman finds it impossible to meet, the explanation being simple. The farmers' yard is a lumber company, the stockholders in which are farmers in the district in which it operates and who, of course, not only buy from it themselves, but use their influence to attract to it the trade of their friends and acquaintances. These shareholders often run up into the hundreds and form a considerable percentage of the trade tributary to the town in which the coöperative yard is located. The principal advantage which the coöperative yard has over the regular retail dealer, however, lies in the fact that the former is organized with the express purpose of selling lumber not at a profit but upon a basis which will just cover the cost of the material sold and the expense incident to the business. The idea in forming the yards is to do away with the middle man, the farmers figuring that by buying their lumber in this manner they eliminate the profit of the retailer. Thus, if a thousand feet of lumber costs the coöperative yard \$20 delivered and the expense of operation is 10 percent this lumber would be sold for \$22. The regular or legitimate dealer paying the same price for lumber and adding thereto 10 percent to cover expenses would still have to figure his profit. If he added a profit to the \$22 he would, of course, be unable to meet the price of the coöperative yards. If he did not, the sale would really mean a loss to him. Coöperative yard companies, however, are successful in comparatively few instances and the failures are

due to the fact that the men controlling the yards know nothing about the lumber business. They, of course, must hire a yard manager. They know nothing about what qualifications such a man should possess. They simply let it be known that they want a yard manager at \$40 or \$50 a month and when an applicant appears, if he "looks good" to the board of directors, he gets the job. If it so happens that the manager is a good man, which is improbable, he will not hold the position long for the reason that the board will continually interfere with him, making him do things he knows he should not do and preventing him from doing things his business sense tells him ought to be done, until he is forced to resign. On the other hand if the man is a lightweight, he will yield to every whim of the directors, with the result that the yard will run itself into a hole inside of a year and will be forced to go out of business.

Comparison of Retailers Past and Present.

How does the retail lumber dealer of today compare with his predecessor of twenty-five years ago?

Within the last generation there has been a great development in the retail lumber dealer. In the old days he would visit the mills and either purchase or contract for his year's stock, necessarily becoming familiar with the lumber at the mills, the grades, prices, methods of manufacture etc. Now, however, the average retail dealer seldom sees the saw mill whose product he handles. He purchases from a traveling salesman or by letter. If he takes a lumber paper, he has the opportunity to be as well informed as the wholesaler or manufacturer himself and if he belongs to an association and attends its meetings

regularly, he is better educated in the trade than was his predecessor, as he has the opportunity to review the business tactics employed by 2,000 or 3,000 other dealers. But the retailer who runs along in his own little groove, reads no lumber literature, attends no meetings and visits no mills suffers by comparison with the dealer of thirty years ago, although the latter had far fewer advantages offered him.

Open Quotation Evil.

I enclose envelope I received today by mail showing how one dealer advertises his goods by quoting prices on the outside and face side of his envelope. Should the retail dealer give any patronage to a manufacturer who advertises his goods in this way?

Many retail lumber dealers have answered this question for themselves, giving a decided negative to the proposition. Open quotations, whether on postal cards or on the envelope containing other prices, are viewed with disfavor in a great many quarters.

According to the view of the average retail dealer, quotations on any class of material are made for his exclusive benefit and should not be sent out so that a probable customer may be informed as to prices offered as a special inducement for the trade. In many cases the goods so quoted are not of a character to meet the demands of the retailer's customers and yet if the report be circulated that he pays only so much for certain kinds of lumber or millwork it will operate to his disadvantage. Some of the bargains, it is true, are real ones; others are of a doubtful nature, and still other offers the dealer finds it impossible or inadvisable to accept.

Now a word to the house that desires to advertise in this way: Why would it not be as effective adver-

tising to print the description of the specialties offered and instead of the price attached to each to give a notation to this effect: "For special prices on these bargains look inside." This should serve to whet the curiosity of those who received the quotation and the end desired would have been achieved in that a very large percentage of those receiving the envelope would have followed the advice given and looked inside to satisfy their curiosity, if for no other purpose.

Poacher, Defined.

I have heard the word "poacher" used in different connections. Will you kindly define the meaning of this term for me?

Each establishment in the lumber trade is what may be termed a legitimate orbit. When those in charge of the operation depart from this orbit they necessarily are poaching on the preserves of some other business. Wholesale dealers and manufacturers, by trade customs, are supposed to limit their sales to retail lumbermen and certain classes of large consumers. When they sell direct to builders or contractors they are poaching on the trade of some retail dealer. Retail dealers poach on each other when a yard in one place ships a car or sells a bill to the customers of a yard in another town. Another common form of poaching is that carried on by contractors who keep on hand a small stock of lumber and make a practice of selling small lots to whomsoever wants to buy, thus actively engaging in the lumber business without laying in what is considered to be adequate stock. Another class are those business men who make pretences of being dealers in lumber by carrying a little

stock but not enough to entitle them to rank as retail dealers. Others are the mail order house which sells goods from catalog to any one who wants to buy and the wholesale dealer and manufacturer who adopt similar methods.

Deviation from Contracts for Specific Woods.

Can a contractor who has agreed to put up a building, using certain grades and kinds of material, substitute something that is not in accordance with specifications?

He cannot. A specific contract calls for certain goods and deviation from these terms constitutes a breach regardless of whether a higher or lower grade of material is used. A case in point (*Cannon vs. Hunt*, October 30, 1902, 42 Southeastern, 734) was decided recently by the Supreme court of Georgia and was summed up as given here:

Whether or not lumber furnished by a contractor be just as "good and durable" as lumber of a different kind, called for by his contract, is not the proper test for determining whether there has been a substantial compliance on his part with the terms thereof. On the contrary, the owner of the building is entitled to damages where material different from that specified in the contract has been used in the construction of a building, even though the materials used be in all respects equally as good as those the contractor agreed to furnish.

Another decision bearing upon this same point (*Trotter vs. Tousey*, November 18, 1902, 92 Northwestern Reporter, 544) is taken from the Michigan court records and is that under a contract for lumber, where the purchasers had not agreed to take any other lumber than that which had been paid for by them and had been marked "Sold" to them, and where, by this contract, the seller agreed to ship this lumber to the purchasers, but he sold it to other parties instead, the

purchasers' right of action was complete, and it was no defense to say that the seller subsequently offered to deliver other lumber. The court says that the purchasers had two remedies open to them, viz.: To sue in trover for conversion or to waive the tort and bring *assumpsit*—in other words, an action for a breach of contract.

If the action had been in trover, or an action on the case for fraud, the measure of damages in each case would have been the value of the lumber at the time of its appropriation by the seller. If it was worth more than the contract price at the time of its conversion, that worth was the measure of damages. If it was worth less, that worth was the measure. If it was worth the same, then the purchase price became the measure. If the action was based upon the contract for a breach thereof it was difficult to see why the measure of damages would not be the same. In either form of action the purchasers had lost their property. It had been appropriated by the seller. Their loss was not what they paid for it but its worth when wrongfully disposed of by the seller. Consequently the court was of the opinion that the measure of damages was the value of the lumber at the time the seller appropriated it by sale and delivery to other parties.

Remedy for Poaching Evil.

Is there any remedy for the poaching evil?

While the operations of poachers unquestionably are in restraint of trade—legitimate trade—and the antitrust laws existing in almost all states provide for the dissolution or abolition of any influence so operating, any direct action against these people would

also be conceived to be in restraint of trade and its projectors amenable to these antitrust statutes. For the general good of the retail trade, however, a sort of reciprocal understanding exists between what may be termed the legitimate manufacturers and wholesalers on the one hand and the legitimate retailers on the other. This understanding is in no way binding and should not be considered to mean that any concerted action is taken on the part of the retailers, manufacturers or wholesalers against the poachers, but in the interests of healthful trade conditions these manufacturers and wholesalers do not sell to the poaching trade. In this action they are merely upholding the rights of their customers and in turn those customers naturally select for their trade the manufacturers and wholesalers who afford them this protection.

Advantage to Wholesaler Who Understands the Retail Trade.

Is it any advantage to the wholesaler to thoroughly understand the retail trade?

Unquestionably it is. The wholesaler who also does a retail business is in a much better position to judge of the needs of the trade than is the man who has no direct connection with the consumer. If the manufacturer thoroughly understood just what grades are the easiest to dispose of, it is probable that there would be considerable change in the output of the mill. Of course it would not do for a retail dealer to dictate lumber manufacture, even if such a thing were possible, because understanding only his own end of the business there would be a great waste of timber, but if it were possible for the manufacturer to be

educated to the needs of the consuming public, as the retailer has to be, conditions would be greatly improved and more satisfactory to both.

Delay in Filing Complaints.

Suppose a yard man receives a car of lumber, say in January, which is unloaded into the sheds, and does not discover until he has use for it in the spring, three or four months later, that it is badly off grade, lumber having been paid for in the meantime; what recourse has yard man from shipper?

Can retailer call for official inspector, same as wholesaler, and if so to whom should he apply?

Undeniably the retail dealer is at fault in accepting and paying for a shipment which obviously he did not inspect. It is to be presumed that the work of unloading the car was given over to the employees of the yard man during January, when the weather was cold, and that they were more interested in getting through with their task than in the quality of stock they were storing away. Also it is possible that they were not instructed to estimate the character of the lumber and may not have been told with what grades the car was supposed to be loaded. To all intents and purposes the buyer was not greatly concerned in regard to the character of the stock, paying for it when the account matured and giving no farther attention to the lumber until it was needed, when, as stated, it was found to be below grade. It would have been a comparatively easy matter to adjust the complaint at the time the car was received. It is a somewhat complicated one now and amicable arrangement depends much upon the character and disposition of the manufacturer from whom it was bought. If the shipper is willing to accept the affi-

davit of the yard man and his employees that the lumber is that purchased from him inspection can be made, the percentage of stock below grade determined, then a basis of settlement can be reached. If, however, the shipper is disposed to question the authenticity of the reports of the yard man and his employees the loss would better be pocketed and charged up to education, the dealer mentally resolving never in the future to receive and pay for lumber which he does not inspect or look over himself, or have the work done by a competent employee. An inspector if sent to this yard would report that he found or was shown so much lumber of such and such character and there his authority would end, and it would be necessary for the shipper to rely on the statements of the receivers to the effect that this was the lumber he had supplied. He is not, of course, compelled to do this, though evidence of this character would be relevant in court.

Retail lumber dealers can apply for the services of an official inspector, though usually the inspector is sent out by the association of which the shipper is a member. Details in regard to how lumber of various kinds is inspected can be secured from any association secretary.

To Keep Lime from Slacking.

What method, if any, has been successful in preventing slacking of lime?

Every retail yardman who carries lime has experienced difficulty and suffered loss through a considerable percentage of it slacking, making it of small value. Various methods have been employed in an effort to keep the lime from slacking and it appears

that the one giving the best results is the simple expedient of keeping out the air, as nearly as possible. Lime packed into a jar which was sealed airtight was subjected to varying degrees of heat and cold and moisture for over a year and remained in perfect condition. From this it was judged that a lime house built to be practically airtight would result in a saving of all or nearly all of the lime which ordinarily slacks away.

Authority on Steel Squares.

What is the most reliable authority on steel squares?

"The Steel Square and its Uses," by Hodgson, probably is the best available authority upon the subject.

Retail Opportunities in Nevada.

I have been considering engaging in the retail lumber business in Nevada and would like to know if you could give me any information in regard thereto. I was thinking of locating in Humboldt county somewhere near the gold fields, or at Tonopah.

There are about a score of concerns engaged in the lumber business in Nevada, so if the correspondent desires to locate there he can select a territory where there will be absolutely no competition. It would be wise, however, for him to take along a bunch of customers if he intends to locate in an unoccupied territory. This would be necessary as the present inhabitants, coyotes and rattlesnakes, heretofore have used little lumber in the construction of their dwellings, and it will be necessary for him to bring consumers with him or educate the present population up to a point where they would be content to live in frame dwellings. At present they use stone and adobe for

their buildings. Of the sixteen lumber concerns in Nevada one is engaged in getting out piling and poles, four operate saw mills and three run planing mills and box factories; three general stores supply the lumber requirements of their districts. It is presumed that the remainder are retail yards.

Humboldt county has only one city of any importance, Winnemucca, which has a population of 2,059. Mining is about the only industry in that section. The country is rough and mountainous and it will be many years before there will be any necessity for a retail lumber yard. Tonopah (or Butler), in Nye county, is probably seventy-five miles from the nearest railroad. It has a population of 4,000. The only part of the state which is being settled to any extent now is the extreme western central, in which Reno, Carson City and Virginia City are located, all of which are growing places, and the surrounding country is the best in the state that so far has been exploited from a timber or agricultural standpoint. Vast mining industries are assuming shape in other parts of the state, but the population is not growing fast enough to warrant the establishment of retail lumber yards.

Use of Slacked Lime.

Is there any use for the lime which slacks in the lime house?

The lumberman who handles lime and, consequently, who has more or less of it slacked on his hands (for there are few lime houses that do not allow a certain amount of slacking), can use this to advantage by sprinkling it around his yard under the lumber piles and in any low, wet spots there may be. Lime is a powerful disinfectant. Of course, in slacking

it loses some of its disinfecting virtue, but enough is retained to serve a good purpose if the lime is liberally applied. Usually there is a limited demand for slacked lime from the general trade.

Cement and Concrete.

How long have cement and concrete been in use?

Evidences exist tending to show that the Romans used cement and concrete 2,500 years ago. While these materials as used in ancient times were long lived, there has been a steady advance made in their composition and it is claimed that the present armored concrete is virtually everlasting.

Buying a Retail Yard.

We are in the market for a paying lumber yard and are considering a proposition where the bonus asked is \$3,300. This yard is in a town having a population of 2,200 and the sales have averaged \$30,000 for the last thirteen years. We would like to know whether a business of that volume is worth the bonus asked. The business is done on about 22 percent margin and we are of the opinion that it might be advanced to 25 percent. The investment would be about \$25,000—\$10,000 in real estate, \$11,000 in stock and the balance credit.

Judging this proposition by the facts given, it appears to be an exceptionally good investment and the good will or established trade appears to be worth the price asked. Twenty-five thousand dollars invested at 6 percent would give the owner an income of \$1,500. If the average sales remained unchanged and the profits derived from the business continued the same the net income would be \$6,600, allowing \$5,100 for the profit of the operator over and above the interest on the capital employed. This would permit

the employment of a manager at a salary of \$1,200 a year and still leave a comfortable margin for the owner; or should the purchaser desire to run the business himself he would have a salary of \$5,000, which should be satisfactory when the amount of the investment and the volume of business are considered.

Field in Southern California.

I wish to know the conditions of the lumber business in southern California in the vicinity of Los Angeles. That is, if a party with \$3,000 or \$4,000 can start or run a yard—in other words, can a small fish buy lumber and be let live there? Also about what profit do the retail dealers make a thousand on their stock there? Is there an association in southern California; who is the secretary, and do most of the yards do business on association principles?

A small fish would have as good an opportunity to survive in the southern California lumber sea as in any other part of the country. As a matter of fact, the majority of the retail concerns in that district began in a small way and have grown to their present proportions by hard labor and close application to their work. It may easily be imagined that the profits made by the southern California retailers vary from \$1 to \$10 a thousand, but as to the average in that or any other district we would not care to take the responsibility of approximating.

PART III.—COMMERCIAL WOODS.

HARDWOODS.

Hardwoods and Softwoods Defined.

Please designate which of the following woods are hardwoods and which soft woods: hickory, white oak, red oak, elm, blue poplar, yellow poplar, ash, lind (linden or *Tilia Americana*) cottonwood, cypress and sweet gum.

Hardwoods are broad leaved trees; soft woods the needle bearers. This is the only way of differentiating between the two and is almost universally employed in the United States, being authorized by the forest service. On the authority of the forest service and of the *AMERICAN LUMBERMAN* it recently was held in the trial of a case in Mississippi that the evidence introduced in support of the distinction set forth was sufficient to justify the practice. Cypress is the only wood mentioned of which the classification is at all doubtful and there seems to be no reason why it should be an exception to the foregoing rule, which would classify it among the softwoods. All the others are hardwoods.

Hickory of Western Pennsylvania.

Is there any hickory located in Pennsylvania around Pittsburg; and is there any in Kentucky, Tennessee or West Virginia?

It is scarcely probable that any hickory timber could be found in Pennsylvania in commercial quantities. There may be small isolated tracts, but the cost of put-

ting on the market would be heavy. It is, however, one of the component elements of the hardwood forests of Kentucky, Tennessee and West Virginia. It is not found in continuous growth but mixed with oak, poplar, chestnut and other hardwoods.

Linn Wood.

What kind of wood is linn wood, its uses and market value; what are butchers' meat blocks worth?

If the correspondent had specified the location of the kind of trees to which he referred as linn more definite information could be furnished. There is a linn wood in California known locally as blue myrtle, but it is not supposed reference was made to this species. Commercially the linn is known as basswood, botanically as *tilia Americana*. It is found from New Brunswick to Virginia and along the Allegheny mountains south to Georgia, west from New Brunswick to the eastern shores of Lake Superior and southern shores of Lake Winnipeg and south to eastern Dakota, eastern Nebraska and between the two extremes outlined. It is known by various names in different localities, though ordinarily it is called basswood. In some sections it is called American linden, in others linden, lime tree, whitewood, beech, blacklime tree, smoothleaved lime tree, white lind, wickup, yellow basswood and lin. It is used in the manufacture of furniture for sides and bottoms of drawers and other places where it does not show. Basswood also is used to a considerable extent as a building material for siding, finish, both interior and exterior, and for other purposes where hardwood is required; also for making cheap household furniture, kitchen tables etc. Of late years box makers have been utilizing it to a considerable extent and it is also used in the manufacture

of eavestroughs. The prices range from \$12 for the lower grades to as much as \$28 to \$30 for better stock, according to grades and point of delivery. Butcher blocks are made of maple, oak and some other hardwoods.

Advantages of the Hardwoods of the United States.

What advantages have the hardwoods of the United States over those of tropical countries?

Recently in discussing this subject it was said:

As illustrated by the many wood exhibits at the world's fair, the American hardwoods for general utility are far superior to those which are brought from the tropical countries and which are often enthusiastically admired for their grain and polish. These tropical woods are certainly susceptible of a high polish, many of them are finely figured, but when it comes to forming them into furniture their density is an objection.

Not many years ago walnut was the one prevailing furniture wood. In color it presents a somber appearance; still, it was a prime favorite, black walnut furniture being considered good enough for anybody who did not aspire to mahogany. It was one of the best furniture woods we have had, being free from a disposition to warp and growing darker and richer with age. Dame Fashion, however, set her foot down hard on black walnut, since which time walnut furniture has not dared to show its head. The furniture that was in the hands of the manufacturers when the stigma was cast upon it instead of being sacrificed to get rid of it was largely packed in storerooms, thus indicating a belief on the part of the owners that some day Dame Fashion will again put upon it her stamp of approbation. Yet if this should be done the question would be, "Where will the walnut in sufficient quantity to meet the largely increased demand come from?"

When the fashion changed from walnut to oak the labor in the factories was not increased, oak not being materially harder to work than walnut. In the sense of being hard it does not compare with the woods of the warmer countries. There are several countries represented not a single sample

of wood from which but would turn the edge of a good jackknife. To handle it requires an extra quality of steel and a good supply of muscle, especially the latter when hand work is exclusively used, as in many instances it is. The edge of the knife or plane rebels at the work it is required to do, hence the making of furniture in the tropics is a slow process when compared with the methods which are employed in American factories. Walnut and oak, though hard enough for all practical purposes in the furniture line, may easily be handled on woodworking machines, their density not acting as a barrier. Birch and elm have also come in as furniture woods and are worked as easily as are walnut and oak.

Wisconsin Hardwoods.

What are the native Wisconsin hardwoods?

The hardwoods of Wisconsin in the order of their importance in that state are as follows: Red oak, maple, basswood, birch, elm, black ash, beech, white oak, cherry, walnut, hickory and white ash.

Sugar and Soft Maples.

Does the term "sugar maple" include soft maple?

The *Acer*, or maple family is accredited with sixteen species. These from a popular standpoint may be divided into two general classes, the hard and the soft maples. Sugar maples, properly so called, and those which sometimes are called sugar maple belong to the hard maple class, while none of the soft maples can be properly called a sugar maple, although their botanical name indicates that they contain sugar.

Sugar maple proper is botanically known as *Acer saccharum*. It is known as sugar maple practically all over the United States, although some other popular names are applied to it, such as hard maple, sugar tree, rock maple and black maple.

Another sugar species is *Acer saccharum nigrum*. It is found in Vermont and is scattered through the central western states as far south as Mississippi. It is properly called black maple, but is also referred to as black sugar maple and as hard maple. A variety which is found through the western mountain districts is *Acer saccharum grandidentatum*, known as large-tooth maple, western sugar maple or hard maple. These three varieties are the only ones of any importance that with any propriety can be called sugar maple, while that term should be confined to the first named, the magnificent wood which furnishes the great bulk of maple for the flooring industry.

Three varieties are popularly known as soft maple; they are *Acer glabrum*, or the dwarf maple of the mountain states; *Acer saccharinum*, which is better known as silver maple and is very widely distributed, and *Acer rubrum*, or red maple, which is also widely distributed, being found in practically all of the eastern half of the United States.

There are many interesting local names applied to some of the maples. Thus *Acer spicatum*, or mountain maple, is also called the moose maple in Vermont, low maple in Tennessee and water maple in Kentucky. *Acer Pennsylvanicum*, or striped maple, is called moosewood in New England, Minnesota and some other states, striped dogwood in New York and North Carolina, mountain alder in North Carolina, whistlewood in Michigan, also goosefoot maple.

Acer negundo, or box elder, is known also as ash leaf maple, three leaved maple, black ash, stinking ash, sugar ash and water ash. The most commonly used name for this species and the one of widest extent is box elder.

Acer rubrum, or red maple, is also called swamp maple, water maple, white maple, shoepeg maple (in West Vir-

ginia), scarlet maple and, by the Onondaga Indians in New York, "Ah-we-hot-kuah," meaning red flower.

Proper Time to Cut Oak.

How long will oak last?

This depends a great deal upon the time of the year when the timber is cut, how it is seasoned and whether it is so placed that the air can reach it. It is said that an oak sill cut in May or June and enclosed in the foundation of a building before it has been properly seasoned and where there is no ventilation will decay in from eight to ten years. If, however, it is cut in August, properly seasoned and so placed that the air will circulate around it, it will last from 100 to 500 years. In fact, there are instances where the wood has lasted much longer. The doors, believed to be the original ones, of the inner chapel of Westminster Abbey, built in the reign of Henry III and consecrated in 1269, A. D., and therefore over 600 years old, were of oak and when they were replaced a comparatively few years ago they were found to be in a good state of preservation.

What Is Bay Poplar?

Will you kindly advise us what bay poplar is? Also would like to have some data about other gums of the United States.

Bay poplar is a fancy name for tupelo gum. By what chain of circumstances it was given the name of bay poplar is not known, it probably being first so called by some enterprising lumberman who endeavored to facilitate sales by offering his product under the adopted name, bay poplar.

There are three species of the gum found in this coun-

try in commercial quantities. Red gum is perhaps the most widely known on account of its use in the English markets under the name of satin walnut. The range of red gum, also called sweet gum, is from Connecticut southwest to southeastern Missouri and Arkansas, south to Texas and east to Florida. It is known by various names. In New Jersey it is called alligator wood and also blisted. In the lumber markets it is known as red gum, star leaved gum and satin walnut. In the majority of the eastern states it is called sweet gum and is known by the same name in various other localities.

Black gum, the second of the three great commercial gums of the country, is found from the Kennebec river in Maine west as far as southern Ontario and southern Michigan, south as far as Florida and extending to the Brazos river in Texas, the line from that point to Michigan passing through southeastern Missouri. In Florida black gum is known as tupelo gum, in West Virginia as stinkwood, in Tennessee as wild pear tree and yellow gum tree; in many of the eastern and southern states as sour and black gum and in some localities in addition to Florida it is also known as tupelo.

The third of the species is tupelo, to which the correspondent has referred. This is found from the southern borders of South Carolina near the coast through Georgia as far south as the northern part of Florida, and to a limited extent in the territory west of the location given. Various names have been given it in these states but generally it is known as tupelo. What is termed by the forest officials cotton gum is also known as tupelo in some localities. This wood has a range in addition to that given sour tupelo through the Gulf states as far west as Texas to the Neches river northward through Arkansas, the species ceasing in the vicinity of the Wabash river and in southern Illinois.

Tupelo gum will average 75 to 90 percent of sapwood, the appearance of which is very similar to that of the sap of the yellow poplar. The heartwood of the tupelo is small, of a dark brown color and is not used where lumber is manufactured and sold under the name of bay poplar. A considerable quantity of tupelo is being manufactured and marketed under the name given above. The material has not to recommend it all the good qualities possessed by poplar. The fiber of the tupelo is involved and on account of this interlacing the product warps easily and the nature of the wood is such that it stains very readily, unless a drying process of exceptional merit is employed.

The many different names that have been given to the different species of the gum family have created a great deal of confusion in the minds of those who have to do with their products. In many instances the word gum is left off entirely and some other name wholly foreign to the tree has been applied. Olive tree, wild pear tree, peperidge, blisted, alligator wood and various other names have been given to members of the gum family.

White Holly.

Where does white holly grow, and how?

The white holly, *Ilex opaca*, is one of the five species of this family found in the United States that attain commercial size. It has a range of growth from the coast region of Massachusetts to Florida and in southern Indiana through the Mississippi valley to the Gulf and through Missouri, Arkansas, Louisiana and eastern Texas. In its highest perfection the wood grows only in rich alluvial swamps in the southern states. When felled in winter and sawn into lumber or veneers thi

species is nearly white, turning brown with age and exposure. The tree is an evergreen and bears red berries which ripen about Christmas time and are largely used for decorative purposes.

Holly attains its largest size in those river swamps which are overflowed by freshets that bring down deposits of thick clay sediment. In swamps which are overflowed by freshets which do not deposit clay the holly never grows large enough for commercial purposes but remains a shrub. Under favorable conditions it is found as much as seventeen inches in diameter, ten or twelve feet from the ground, and occasionally attains a diameter of twenty-three inches twelve or fourteen feet from the ground. This growth has a trunk entirely clear of defects for this length. Holly to be sawed into lumber or veneers is obtained from these swamps in lengths, clear of all defects, of from five to fourteen feet, ten to twenty inches in diameter.

Accompanying the growth are oak, ash, hickory, beech, sweet gum and other woods peculiar to such swamp ridges, and it thrives better in the shade of such trees than in the open. The wood is used in the making of fancy tables, ladies' workboxes, paper cutters, rulers, for inlaid work, wooden business cards, and for a great number of minor and fancy purposes.

Arkansas Timber Trees.

What are the principal commercial trees of Arkansas?

Over seventy varieties of merchantable timber have been found within the Arkansas state boundaries. Fully half of these are hardwoods, including black walnut, oak, ash, hickory, maple, cherry, gum, sycamore, holly, butternut and locust. These hardwoods are of excellent development, Arkansas oak being claimed to be unex-

celled. Shortleaf pine and cypress are the principal conifers.

Cocobola Wood.

You doubtless are familiar with cocobola and the uses to which it is put. Can you tell us from what tree this wood is obtained and can you give us its botanical name? We find some difficulty in identifying it.

Cocobola is one of the cabinet woods of the English and American markets. It is said to be the showiest and most strikingly colored of any distinctively cabinet wood. The logs reaching the markets are, as a rule, small and badly hewn. It weighs when dry about seventy-five pounds to the cubic foot and in density is similar to ebony. The grain is close and even. The color of the heart wood is deep orange or orange red, streaked sharply with short jet black lines. The sap wood is brownish white, with a sharp line of demarkation between it and the heart. This timber is not to be confused with *Cocobola uvifera* and has nothing in common with the wood save a similarity of name. The confusion apparently results from the resemblance of names and not from the appearance of the two woods.

Southern Versus Northern Oak.

Are there any defects that southern white oak timber is subject to, or more subject to than northern oak, which makes it of less value in the market?

With respect to white oak, the Tennessee grown timber, especially that of the eastern part of the state, is as good as is found anywhere. Until within the last few years a certain amount of prejudice existed against the southern white oak, but if properly manufactured the timber from the uplands of the south now is considered equal to that from any other district. The oak

from the swamp lands of Arkansas, Louisiana, Mississippi and Alabama is considered somewhat inferior, though it is very difficult to say in what respect. In fact it is necessary to handle both woods and to compare them to understand the difference. The swampy growth oak shows a coarser grain and by some is not deemed to be fully as handsomely figured as in the northern wood.

Thickness of Green Hardwood Stock.

Will you kindly inform us if 1-16 inch is sufficient to allow for shrinkage in a 4-4 board and $\frac{1}{4}$ inch in 8-4 board in poplar, oak and chestnut in a dry mill as well as a river mill?

As a general proposition it may be said that 1-16 inch is sufficient allowance for shrinkage on a 4-4 board. In some instances it is more than is necessary. Some of the river hardwood mills allow only 1-32 where logs are water seasoned, which tends to decrease the shrinkage. An allowance of 1-16 for shrinkage can safely be made on 4-4 boards, but it is not necessary to allow 1-4 for 2-inch stock of any of the woods mentioned.

Sources of Maple Supply.

What sections of the country are the principal sources of maple supply?

Maple is one of the woods in widest distribution in the United States. It is found in every state of the union, but in very few parts of the country does it attain commercial importance. The bulk of the maple product comes from Michigan, largely from the upper end of the Lower Peninsula. Maple lumber is produced in New York, Pennsylvania, and in nearly all of the New England states. This product is practically all from rock or hard maple. Soft maple is produced in limited quantities

in the great central hardwood belt, where it is found mixed with other timbers. The total maple product for 1905, as reported by the bureau of the census, was 587,558,000 feet; the reported product in 1900 was 605,654,000 feet. The quantity produced in Michigan in 1905 cannot be ascertained, but the output in 1900 was 398,165,000 feet or about 66 percent of the entire product. The output in Michigan has not decreased within the last five years, with the possibility of an increase being shown were the accurate figures available.

Red and Black Oaks.

Will you kindly inform me regarding the placing of black oak with red oak in selling the latter?

Oak as a commercial lumber has been roughly divided into two classes—red oak and white oak. Consumers apparently are well satisfied with these designations and possibly equally so with the kind of lumber furnished when one or the other is specified. As a matter of fact, however, it is perhaps safe to say that the majority of the stock purporting to be either red oak or white oak is a mixture of two or more kinds of oak. From the very nature of the understanding in regard to what constitutes one or the other of these timbers it is impossible to avoid this confusion and as all concerned apparently are content it is perhaps unnecessary to pay too great heed to the amount of substitution going on. Take red oak, for instance, botanically known as *Quercus rubra* Linn; in some localities is called red oak, in other black oak and in still others Spanish oak. Scarlet oak, *Quercus coccinea* Muenchh, also is known as red oak, black oak and Spanish oak. In view of this confusing of names it is no wonder that there is confusion as to what constitutes red oak.

As a matter of fact these two members of the oak family—red and so-called black oak—are used when common oak is to be supplied. There does not seem to be any discrimination as between them and unless one kind were expressly stipulated there doubtless would be no complaint were the two mixed. It scarcely is correct to speak of two woods inasmuch as the names are used interchangeably in different parts of the country and what might be termed red oak in one locality would be called black oak in another. Black oak is not considered of enough importance as a member of the oak family to comprise a distinct species thereof, although black jack, blue jack and blue oak are dignified in that manner; locally, however, it is so employed. The nearest approach to black oak is California black oak, found on certain parts of the Pacific slope.

Second Growth Hickory.

Will you kindly define what second growth hickory is?

Probably a better term for second growth hickory would be young hickory timber. Second growth timber is that which springs up after the original forest has been removed. In the present instance the term includes not only this subsequent growth of hickory but all young hickory timber. It is used largely where small pieces of wood, capable of withstanding a heavy strain, are desired. This makes it a favorite with handle makers and it is also in demand by vehicle manufacturers, for buggy spokes, bolsters and other wooden parts of the vehicle which are subjected to rough usage. Small hickory trees from six to ten inches in diameter are preferred for such purposes and apparently the wood is stronger and possesses greater durability than does the product of the larger trees.

Five Leading Furniture Woods.

What are the leading furniture woods and what are the styles of finishing?

The woods are five—oak, mahogany, birch, walnut and birdseye maple. Oak may be either red or white, plain or quartered. In quartered oak there are three finishes that are most popular today, golden, weathered and Antwerp, the latter being practically nothing but weathered oak given a high polish.

Mahogany by the best and most artistic makers is not highly colored, just slightly darkened, but still the popular requirement is for a dark color and a piano polish. The finest work, however, is finished with what is called a wax polish that gives a sort of satiny effect.

Birch is almost invariably mahoganized and frequently pieces such as tables, dressing tables and buffets have tops and most conspicuous parts of mahogany with mahoganized birch sides, posts and legs. Curly birch is, next to birdseye maple, the most genuine thing in the list. It is almost invariably finished strictly in its natural color.

Birdseye maple is conspicuous in furniture exhibits but does not sell very well except for children's and misses' chamber sets, for it is difficult to hold the color.

In addition to these leading woods, which may be called the fashionable ones, a considerable amount of ash and some elm may be found in the cheap grades.

Beech for Paving Purposes.

Has beech ever been used successfully for paving purposes?

Experiments made at Maribrunn, Germany, demonstrated that beech paving blocks could be used to advantage and would compete with the products of the coniferous trees. Four methods of treatment with creosote and tar oil were employed, as follows:

Soaking for ten minutes to an hour, according to the character of the wood—whether open or close grained; boiling in oil and cooling therein for sixteen to twenty hours; washing down with the oil at a temperature of 104 degrees Centigrade or 120 degrees Fahrenheit, and letting cool; exhausting the sap by means of a vacuum pump and then driving the hot oil into the pores. The last named method was found the most rapid and effectual and the blocks soon were ready for use, whether they had been wet or dry. It was found advisable to reextract some of the absorbed oil by the vacuum process, the wood having absorbed too much. After the second pumping out the wood contained per cubic meter (35.3 cubic feet) of originally air dried wood, 215 kilograms (473 pounds) of the oil. Half dried wood retained 270 kilograms (594 pounds) per cubic meter; fresh felled 180 kilograms (395 pounds); water-logged wood retained 40 to 100 kilograms (88 to 220 pounds). It was found advisable to treat the creosoted blocks with a 25 percent aqueous solution of chloride of magnesium a few days after the creosoting to do away with shrinkage and swelling and the tendency to split. Such blocks when laid with strips of sand between or space enough to fill in with sand and a strip of sand or clay at the sides of the street 2 to 4 inches wide make a highly satisfactory pavement, offering much greater resistance to hoofs and iron tires than pine.

Southern Red Cedar.

What are the commercial uses of southern red cedar?

The red cedar of the southern states (*Juniperus virginiana*), which grows on dry, gravelly slopes and rocky ridges, from southern Nova Scotia to Georgia, Alabama and Mississippi, westward to Dakota, Ne-

braska, Kansas and eastern Texas, probably has a wider range of usefulness than any other wood. It is manufactured into high class cabinets and cabinet articles of high value; it is made into chests which are moth proof because of the aromatic quality of the wood, and it is also used for fence posts, poles, railroad ties etc. The wood is finely colored, being of a dull red, and fine grained. It possesses wonderful durability and its aromatic quality protects it against destructive insects. Another species of red cedar (*Juniperus bardadensis*) is often confused with the above. It has a more limited range (imperfectly known), and seems to be confined to Georgia and Florida. It grows on swampy land. It also is fine grained, of a dull red color and fragrant. Lead pencils are made of its wood, formerly to the exclusion of all other woods.

Cottonwood as Siding.

Will cottonwood make a lasting siding? How does it compare with white pine for weather boarding?

Cottonwood makes an excellent siding if it is kept covered with a good coat of paint. It will not last very long, however, if exposed to the weather unpainted. This fact, together with its greater tendency to warp, is what makes it inferior to white pine for this purpose; in addition to which it is not quite as easily handled by the carpenter.

White Walnut.

What is white walnut?

Butternut, oil nut and white walnut are names given in different localities to *Juglans cinerea*, which by scientific authorities are one and the same wood.

Chittimwood

What is chittimwood, and where does it grow?

The chittim tree, *Bumelia lanuginosa*, abounds in eastern Tennessee and western North Carolina, although occasionally it is found as far north as southern Kentucky, as far south as Florida and Alabama and west to Illinois and Missouri, reaching its largest size in eastern Texas. It is also called chattamwood, bellwood, shittimwood and peawood. A considerable portion of it is burley. The wood is reddish yellow in color and runs largely to heart. The tree grows to a considerable height and runs from 18 to 50 inches in diameter. The wood is of practically the same density as red birch, averaging about 32 pounds a cubic foot. The grain is somewhat involved and usually is of splendid figure. Because of its limited growth chittimwood is very little known.

Jarrah.

What kind of wood is jarrah?

Jarrah belongs to the eucalyptus family, *Eucalyptus marginata*, being the scientific name, almost all varieties of which are native to Australia. Some, however, are cultivated in malarious climates because of their power of counteracting malarial influences.

Poplar as Siding.

What are the advantages of poplar for siding material?

Poplar's chief desirable feature for this use is its durability on exposure to the weather. There are instances of poplar siding which had been in place fifty or sixty years and which when removed was perfectly sound and bright. One case is noted of poplar siding

which had been in position fifty-three years, during which period it had been painted only twice and it was in excellent condition when the house was torn down. As painting is expensive, bevel poplar siding is an economical building material after it has been put in place, for it will hold paint longer than most other woods, therefore will not have to be repainted as frequently.

Qualities of Beech.

What are the qualities of beech lumber?

Beech is a hard, strong, close grained wood, but possesses very little elasticity. It is of about the same strength as longleaf yellow pine and oak, but unlike these woods, gives no warning by bending when it is about to break. Beech is not very durable when exposed to the weather, but is well suited for interior construction. It is difficult to season because of its tendency to develop fine checks. Where this can be avoided it will take a fine polish.

Black Gum.

What is black gum and where does it grow?

The range of black gum is from the Kennebec river in Maine to Florida, west to Texas, north to southeastern Missouri and southern Michigan. Small tracts are found throughout the entire eastern states. It is described in Johnson's "Materials of Construction" as being heavy, hard, strong and tough, of fine texture, green to yellowish or grayish white in color and hard to work. It warps and checks considerably and is not durable when exposed to the weather. Black gum grows to medium size with straight, clean trunks.

Linnwood.

What is linnwood?

Linn is a short name for the American linden tree, otherwise known as the limetree, sometimes known as the beetree and commercially known as basswood, the botanical name for which is *Tilia americana*. White basswood, which grows from Pennsylvania, through the Allegheny mountains, to Florida and Alabama; west to southern Indiana and Illinois, Tennessee and Kentucky, is known as wahoo. It is hardly distinguishable from the ordinary basswood, though a different species botanically—*Tilia heterophylla*.

Beech.

What is beech?

The American beech tree, the botanical name of which is *Fagus atropunicea*, is a hardwood that grows from Nova Scotia to the northern shores of Lake Huron and northern Wisconsin, south to western Florida and through southern Illinois and southeastern Missouri to the valley of the Trinity river, Texas. In the northern country it is known as beech; in Maine, Vermont, Kentucky and Ohio it is referred to as red beech, and in Michigan and some sections of Ohio and Maine it is known as white beech. In Arkansas it is sometimes referred to as ridge beech. The beech reaches its best development on intervalle lands in the basin of the lower Ohio river and on the slopes of the southern Allegheny mountains, where it is not unusual to see trees four feet in diameter. The beech is distinguished by a smooth, unbroken, steel-gray bark. Its leaves are oblong, being about half as wide as they are long. It flowers in May and bears a small ovoid, triangular nut incased in a prickly bur. The wood is

hard, tough, close grained and strong. It is easily worked and takes a smooth, beautiful finish of various shades of reddish brown.

Best Time to Cut Oak.

What is the best time to cut oak?

The time of year an oak tree is felled is an important consideration in the successful manufacture of its lumber. Unlike other trees, oak has an acidiferous sap. This sap if left in the wood after the latter is cut will soon ferment, making an acid which will quench fire, and which fermentation is the first stage of decay. This sap stains the wood, destroying its beautiful color and figure. It is also a worm food and the worms which feed upon it go through the wood. The best time to cut oak is from August until the spring sap begins to rise. By August the sap has been changed to mature wood fiber.

Oak for Use in the Ground.

When is it the proper time to cut oak for fence posts, or to be used in the ground, so as to insure the greatest durability?

To secure durability of the timber, oak should be cut after the tree has become dormant at the close of the growing season, and before the sap begins to rise in the spring; that is to say, in the period between from about October to April. If it is necessary to cut it during the growing season the tree should be thoroughly girdled about a week before being felled, or after felling it should be allowed to lie two or three days before the branches are cut off. The leaves will pump out a good deal of the sap, so timber men say, and leave the wood much less susceptible to decay

than if cut into logs immediately on being felled. But most important is careful air drying. A properly seasoned post or railroad tie will last much longer than one that is put into the ground green.

Most Valuable Walnut Tree.

What is the most valuable walnut tree on record?

There is a story, which is not absolutely vouched for, to the effect that a North Carolina walnut tree (curly walnut) was sold for \$1,500, that when cut and placed on the car the lumber brought \$3,000, and, after having been shipped to New York and cut into veneers of from one-sixth to one-half inch it was finally disposed of for nearly \$60,000.

Kinds of Elms.

Will you please give me the botanical names of the different kinds of elm trees? I mean such trees as are variously known as water elm, red elm and hickory elm.

The *Ulmus*, or elm, genus of the *Ulmaceæ* family, is divided into five botanical species, each of which is familiarly known by names common to the localities where they are used. Thus the *Ulmus crassifolia*, or cedar elm, is called both cedar and red elm in Texas, while in Arkansas it is known as the basket elm.

The *Ulmus pubescens*, or slippery elm, is found in North Dakota, eastern Nebraska and from there south to western Florida, central Alabama, Mississippi and Texas, as well as in Ontario and along the lower St. Lawrence river. In addition to slippery elm it is called red elm, red-wooded elm, rock elm, moose elm and Os-hoosk-ak (it slips).

The *Ulmus americana*, otherwise American elm, is more generally known as white elm. It is found over

a large area in the eastern, middle and southern states, where it is also known as the water elm, rock elm and swamp elm. This is the strong timber most used in the industries.

The *Ulmus racemosa*, or cork elm, is also found pretty generally all over the United States, and is colloquially termed, in addition to its general name, hickory elm, rock elm, white elm, northern cork-barked elm, corkbark elm, northern cork elm, cliff elm, corky white elm.

The *Ulmus alata*, or wing elm, is common to a large territory in the middle west and south. It is also known as winged elm, wahoo, wahoo elm, witch elm, cork elm, water elm, small-leaved elm, red elm, corky elm and mountain elm.

Advent of Mahogany.

When did mahogany first come into use?

So far as known mahogany was first used in ship-building shortly after the discovery of the new world. It was used to repair the English ships during Sir Walter Raleigh's West Indian trip in 1697. It was first imported into England in 1724.

Where Mahogany Grows.

What are the chief sources of mahogany supply?

Mexico, Honduras, Yucutan, Cuba, San Domingo, Central America, South American, the West Indies and Africa are the sources of the world's supply of this valuable hardwood. The San Domingo mahogany is most valued and the larger portion of it is sent to Europe. The United States imports most of the mahogany it uses from Nicaragua and the United States of Colombia.

Species of Mahogany.

What are the species of mahogany?

The common mahogany known to the wood trade is *swietenia*. The second species is called *Mahogani febrifuga* and the third species is the *caloroxylon*.

San Domingo Mahogany.

Is much San Domingo mahogany brought into the United States, and how does it compare with other species of mahogany?

Imports of mahogany from San Domingo are so light that reports issued by the department of commerce and labor do not make any specific mention of it, classing such woods among other miscellaneous receipts from the West Indies. Perhaps if architects understood more clearly the nature of the San Domingo product and the limited amount that is received in this country they would be careful about specifying its use in buildings for which they have furnished plans and specifications.

San Domingo mahogany is small and the imported logs oftentimes are no larger than railroad ties. The wood grows in the western part of San Domingo and the logs are cut and carried, strapped to the backs of mules, from the interior to the coast. San Domingo mahogany is used almost entirely for carving purposes and is not of suitable character for interior work. Doubtless many of those whose specifications call for a building to be finished in San Domingo mahogany would think the lumberman furnishing the material a fit subject for an asylum were he to send the real San Domingo product which on an average would produce boards not to exceed 6 feet long and 8 inches wide. The trouble seems to be that people have gotten it into their heads that San Domingo wood is

something a little bit better than the average and when it is insisted upon the architects and builders say "All right," and then get a good article of mahogany lumber and put it in. Honduras and Cuban mahoganies are often used for the supposed product of San Domingo. Honduras mahogany is a very fine figured wood and commands a high price in English and American markets.

For the year ended June 30, 1904, imports from San Domingo amounted to 82,000 feet, while imports of mahogany from British Honduras aggregated 5,000,000 feet, with about the same quantity from Cuba and about 9,000,000 from the United Kingdom and 16,000,000 from Mexico.

Just what quantity of mahogany is sold for San Domingo product is not known. The vast majority of buyers, referring more especially to those who purchase furniture and other articles of mahogany—a mahogany desk, table or suite of furniture—as a rule never inquire as to the origin of the material used in constructing that special piece of furniture.

If this question was probed farther the investigator doubtless would find that manufacturers buy certain kinds of mahogany and sell mahogany articles, for, as intimated, the average customer knows very little if anything about the relative character of the mahogany of various countries. Naturally the difference between the more beautifully figured wood and the more ordinary appearing article can be distinguished by all when the two are placed in contrast; but without such means the average purchaser, as stated, is quite liable to buy mahogany furniture and not San Domingo or any other special kind and this statement holds good in house furnishing—a special wood is specified, but

few are well enough acquainted with its character to tell whether or not it is supplied.

As a general rule the price of mahogany is governed almost entirely by the figure of the wood. Manufacturers buy in accordance with that idea and are willing to pay good prices for high grade logs and many have a decided preference for the products of certain countries. The great variance in the price of mahogany imports is shown by the August, 1904, report given herewith:

FROM—	Quantity.	Value.	Average.
United Kingdom	481,000	\$55,593	\$115.58
Central America	824,000	40,387	49.01
Mexico	670,000	14,082	21.02
Cuba	301,000	19,043	63.26
Other West Indies and Ber-			
muda	3,000	133	44.33
South America	751,000	16,127	21.47

In addition to the foregoing there was an import of 14,000 feet listed from "other countries," the average value of which was \$789.50 a thousand. There were no means at hand to ascertain the origin of this abnormally high priced lumber. The import from the United Kingdom usually is valued higher than receipts from any other country. The great variance in the price of mahogany illustrated in the foregoing opens possibilities for substitution which cannot be resisted in some quarters. The correspondent points out wherein substitution is practically forced upon the manufacturers by the specifications which call for amounts of San Domingo mahogany largely in excess of the available supply. The import of such wood is so light that in the summary compiled each month by the department of commerce and labor it is not deemed worthy of being listed separately.

Hardwood Industry Past and Present.

Will you kindly give a comparison between the hardwood lumber industry of the past and present?

Many self styled critics of the men who conceived and carried out great projects are wont to deplore and lament the admittedly lavish use of the hardwoods of the great central eastern belt by the early settlers. That the great, unbroken hardwood forests of Ohio, Indiana, Kentucky and Tennessee have in large measure disappeared and that in all probability they never will be replaced by a like growth is, according to the philosophy of the gratuitous reviewers, a calamity of such stupendous proportions as to undermine the otherwise firm foundations upon which the industries of the country rest. When the settler felled the trees which marked the site of his future home he was not impelled by a spirit of venomous antagonism to the forest *per se*. His explanation of the act would probably have been that without a clearing he could not erect his house and without more clearings he could not raise a crop. His encroachments, admittedly large, upon the hardwood resources of his adopted home were justified on the basis of necessity. A part of the timber was used in building houses and barns and fencing in his fields and pastures, though perhaps this was a small percentage of the total amount of timber felled. The remainder was burned in order to get it out of the way. At the time this settlement was going on the timber was valueless.

The destruction of a considerable part of the hardwood forest in this manner and a subsequent demand for hardwood lumber from other quarters where nature clothed the earth with trees in a less lavish manner were instrumental in creating a demand for forest products, which demand to some extent was supplied from the remaining timber tracts. Advancement of the

country and the great improvements which subsequently were made in facilities for supplying the requirements of the people gave rise to a continuous though varying demand for strong wood to be used in the manufacture of various household articles, implements, furniture etc. The fame of American hardwoods spread abroad, from whence ultimately came a heavy demand. Annually a heavy tribute was imposed upon the forests of the central states, resulting in serious depletion of the original timber areas. Territory from which the timber had been removed in order to make room for prosperous farms and villages was increased very materially by the areas from which the forests were removed by the lumbermen.

Naturally as the hardwood timber became more difficult to secure and the original resources began to show signs of exhaustion under the combined attacks of settler and lumberman the remaining timber acquired a greater commercial value. The manufacturer has not profited to any great extent by the increased price, which force of circumstances has compelled him to demand for his products, unless he was fortunate enough earlier in the history of the business to acquire considerable amounts of hardwood timber.

Aside from a consideration of factors of this character in the present situation, it is interesting to note that manufacturers are compelled not only to pay more for stock from which they produce lumber but incur greater expense and are forced to put forth more effort in securing a specified quantity of logs at this time than ever before in their history, and from the nature of things this must continue to be the case. Large tracts of hardwood timber in continuous bodies are, in the main, a thing of the past.

One phase of the hardwood business of the central

states bears close analogy to prophecies concerning the end of the world. The exact date on which this terrestrial globe shall return to chaos has been set many times, but for some unaccountable reason the prophets have been disappointed. In like manner the end of the hardwood industry of the central states has been foretold, but evidently there was some flaw in the calculations of the predictors; at any rate they are making hardwood at the same old stand just as they did ten or fifteen years ago and apparently are getting along without undue inconvenience, but, as stated, manufacturers are paying more for logs than ever before.

Not an unusual bit of testimony offered by the hardwood lumbermen is that ten or fifteen years ago the timber tributary to a mill at a certain point was considered sufficient to keep it in operation from three to six years. Many of these mills are turning out approximately the same quantity today that they did at the time the probable end of their usefulness at that point was set. That such mills are able to continue at work is due primarily to the fact that by reason of the destruction of the major part of the hardwood timber the remainder acquires an increased value. This increase brings into the market timber that originally was considered inaccessible. A farther item in supply comes from the wood lots of the farmers and from the small tracts in out of the way places, where timber can now be cut, hauled a considerable distance to the railway station and shipped to the mill. It was not possible to carry out such a program earlier in the history of the industry, owing to the fact that little value was placed upon hardwood timber and in consequence of which but little money could be expended in procuring it.

Perhaps a better appreciation of the worth of hardwood timber is shown by the attitude of the railway

lines in the territory in the hardwood belt. The majority of these roads are endeavoring to discourage the shipment of hardwood logs from stations along their lines to the mill, evidently on the ground that if such shipments can be checked the timber which otherwise would be cut into lumber will be available for conversion into ties. Despite the handicap of high freight rates on timber and logs a heavy movement continues from these stations to central milling points and probably more of the hardwood lumber of the country is secured in this manner than is generally supposed.

In view of this gradual evolution of the hardwood lumber trade of the United States it is not surprising that other sections of the country where various deciduous trees of commercial importance are found should be levied on to supply a part at least of the increasing demand for hardwood lumber. It is equally evident to those who have followed the development of this industry that prices could not, under the conditions outlined, remain stationary but must represent, in so far as possible, the increased cost of production.

Needs of consumers are sufficient to absorb practically all the hardwood lumber that can be produced and at this time, owing to the stimulated demand from practically all quarters, a prospective call for hardwood stocks in excess of the amount available for immediate use is to be anticipated. As will be remembered by those who keep in touch with this department of the lumber industry, stocks at the end of 1904 were relatively lighter than at the corresponding time in 1903. This condition was not only true with respect to the manufacturers of hardwoods, but with the consumer also. Evidently consumers thought to impose the burden of carrying stocks through the winter months on the manufacturer, with the apparent expectation of buying stocks at the

beginning of 1905 at about the same price they would have paid in the summer and fall of 1904. Their expectations are doomed never to be realized. Light stocks and unfavorable conditions for operating throughout the hardwood producing territory especially have created a shortage in the supply which will not be made good at a very early date. Many of the larger manufacturers with a better appreciation of the situation than have some of the consumers who are imbued with the idea that supplies will be forthcoming indefinitely took a chance on the outcome of a few months ago, and while they could have sold quarter sawed oak, for instance, at from \$65 to \$68 last fall they held for higher prices which they today are securing. Not only have they been able to demand and receive the price for which they were willing to part with their stock eight months ago but in addition a reasonable advance.

Evidently consumers have concluded to charge up to experience the difference between prices they are now paying for their stock and those at which it could have been secured last fall and are laying in supplies for future requirements. At least the consistent buying by the large users, which is general with the possible exception of the furniture factory districts, lends color to the belief that the consumer is out for all the hardwood stock he can get provided prices are within reach of his bank account. It is scarcely possible that hardwood values will dip below their present level during the remainder of the year and the shortage throughout the country may result in an agreeable manner to the producer who has the material to market.

SOFTWOODS.

Sugar and White Pine of the West.

What is the distinction between sugar pine and white pine, as these woods are found in the Pacific coast states?

Sugar pine contains a larger percentage of cellulose than is found in any other tree belonging to the conifer family. It very strongly resembles northern white pine, the only distinction being that it contains minute black dots. The difference in the appearance of the wood, however, is so slight that experts often have been puzzled to tell which was northern white pine and which sugar pine.

Redwood's Fire Resistance.

Is California redwood more or less susceptible to fire than other similar woods?

The fire which followed the San Francisco earthquake demonstrated beyond a doubt the old contention that redwood has great fire resisting qualities. The fire insurance companies credit redwood with a great lessening of fire loss. The wood is nonresinous and it is difficult to make it blaze, requiring great draft. It burns slowly and when highly heated glows like coke.

Durability of Wisconsin Spruce.

Can you tell us anything about the durability of northern Wisconsin spruce? How does it compare with white pine when exposed to the weather—say on sidewalks or in water tanks?

Spruce is better than norway pine for wear and endurance against decay, but for a wood immune from rot where it is subjected to wetting and drying alternately


spruce is not so good as white pine. Spruce is considered an excellent siding or clapboarding in the New England states and in New York, which shows that it is a good lumber to stand the weather. Good, sound spruce should answer the purpose for tanks.

Yellow Pine for Paving Blocks.

To what extent is yellow pine used abroad for paving purposes and what has been the experience of different cities in the use of yellow pine as compared with red gum and other woods?

Wood is used to a considerable extent for paving in a great number of the European cities. In London the principal woods used thus far have been gum, which, as many are aware, was furnished by Edward Alcott and about which there was so much litigation and trouble; and karri and jarrah woods furnished by the Millars' Karri & Jarrah Forest Company, Limited. The gum was introduced as "California cedar" and some big contracts were taken, but on account of the poor quality of material dissatisfaction arose and trouble ensued. A number of streets in Paris are paved with yellow pine, which is giving good service.

It is generally conceded that all wood used for paving purposes should be treated with some preservative process, preferably creosote, as in no other manner can a smooth, permanent street surface be secured. Whether the paving blocks are made of heart wood or sap, if untreated some blocks will decay and cause others to deteriorate and these decaying blocks will soon be ground to pieces under the wheels of heavy traffic. The samples of treated paving blocks in use in Galveston and New Orleans have been exhibited and show little or no decay after years of wear. Wood paving at the present time means the use



of a large number of square blocks which will fit together and make a smooth, even surface, practically noiseless and which is easy to repair should any one portion give out.

White Pine of New England.

The bureau of the census gives many of the New England states a considerable white pine product. Where do the mills secure their logs?

A large number of the abandoned farms in New England are covered with a good growth of pine that is now being cut by portable mills for box boards.

The New England hills have been seeded down by nature from a few scattering trees that were left when the larger timber was cut, twenty-five or fifty years ago. The cones of these trees open in January and February and the pine seed, about the size of a small apple seed, with a wing similar to a fly's wing, is carried quite a distance by high winds and drops on the ground in the snow and is ready to sprout with the first warm rains and sun. Whole hillsides are thus covered over. With half a chance white pine will grow wherever the opportunity is given.

Woods Suitable for Telegraph Poles.

What substitute is available for white cedar for turning out telegraph poles?

The white cedar swamps of the north no longer can supply the demand for poles and it has been found that the cedar timber of Idaho furnishes a satisfactory substitute where heavy poles are not required and cypress from the southern states has also become an important factor in the pole business. The latter wood has been neglected as a substitute for white cedar, but

that of northern Louisiana and eastern Arkansas is found to be entirely satisfactory as a substitute and the value of this timber may be expected to increase in connection with this newly found use.

Western Spruce as Interior Finish.

Please discuss the value of western spruce for interior finish, sash and doors.

The following comprehensive discussion of the value of western spruce for finish is a part of a treatise on "The Value of Our Woods for Interior 'Finish,'" read at a semiannual meeting of the Pacific Coast Lumber Manufacturers' Association, by N. J. Blagen, of Hoquiam, Wash., and may be regarded as a fair statement of the value of western spruce.

In further discussing our wood for interior finish, I wish to call your attention to our beautiful soft grained spruce. This comes nearer to eastern white pine than any other lumber we have on this coast. There is no defect to be guarded against for interior finish; all that is necessary is to thoroughly dry it, outside or in a dry kiln, either of which will make it suitable for first class finish. This is especially well fitted for sash and doors. It makes an excellent door, stands well, does not warp as much as white pine, but it is a little harder to work. When finished however, it is uniformly white and looks almost like an eastern white pine door. It is soft and light and is, therefore, very acceptable to the eastern mechanic. It is one of the best known substitutes for the eastern white pine regular stock door. It also makes very fine finish, and as it is easy to get in any ordinary dimensions, both wide and thick, perfectly clear if so desired, it makes an excellent substitute for white pine finish. Personally I have made spruce doors, put in various kinds of spruce finish in a number of different places for over twenty years, and I wish to say that in my judgment as far as strength and durability are concerned it is fully equal to any white pine I ever saw.

Diseases of Hemlock.

I wish to call the attention to a curious sickness or affection that is attacking the hemlock trees in this region and, as far as I know, all over the state. The leaves a short time ago began to turn brown, beginning with smaller trees, a branch at a time, and now extending to the large trees as well. I broke off a branch to examine it and find that the foliage is completely dead, and will burn when touched with a match. I notice that in some cases the balsam is also turning brown, but not to as great an extent as the hemlock, hardly a tree of which seems to escape.

From the symptoms described the death of the trees evidently is due to the ravages of insects which sometimes attack and destroy the conifers, such as are found in Idaho, where vast quantities of pine timber have been destroyed by insects, which, after lodging in a tree, produced an effect similar to that described in the communication given. It is possible that the death and decay of the hemlock may be to a similar cause.

A West Virginia operator has this to say relative to hemlock disease and how to save the imperiled timber:

Hemlocks are undoubtedly attacked by a small worm similar to the ordinary apple and cherry tree worm and every large tree so infested will die or, in the vernacular, become "dead at the top;" and the only time in which to peel the bark is *now*—this season—as it will never peel hereafter.

The evidence that the "hemlock worm" is at work will be attested later in the season by an abundance of white or cream colored millers in the vicinity of the forests that appear "seared."

The worm feeds upon the bark of the tender shoots as they spring forth and the boughs appear as though a fire had swept over the forest.

Extensive forest fires in the section where the worms appear usually destroy the millers in the summer so there is little danger of a repetition of the pest in any locality for a term of years; but the worms are certain to reappear at intervals wherever there is a hemlock forest.

The forestry division of the United States government

made some investigation of this subject about twelve years ago when this blight appeared in Pennsylvania forests the last time.

Redwood Versus Red Cedar.

Which is preferable for building purposes such as siding, finishing, lumber and shingles of Washington redwood or cedar or California redwood or cedar?

Redwood timber is confined almost wholly to California. In southwestern Oregon is a small amount of redwood, but it is not now being cut and placed on the market. Red cedar of the Pacific coast grows in Oregon and Washington and is also a native of southwestern British Columbia. These woods are separate and distinct and should not be confused, as there is a very material difference in their appearance after being manufactured into lumber or shingles. Redwood, as its name signifies, is red in color. The color of red cedar is brown with a reddish tinge to it. Both woods have met with great favor in the markets in which they are used and as there is some similarity between the purposes for which they are offered there naturally in some rivalry between the two. Both woods give excellent service; both of them are light and easy to work. Redwood is the oldest timber that is being manufactured into lumber in this country. Cedar timber, as a rule, is younger, although some very old trees have been found and manufactured.

Largest Spruce Forest in the World.

What is the biggest forest of spruce timber in the world?

Extending in a northwesterly direction from the east coast of Labrador north to the fiftieth parallel to Alaska is what is believed to be the largest forested area in the world. It is about 3,000 miles long by 500 miles wide



7. CONSTRUCTION OF REDWOOD WATER CONDUITS NEAR DULUTH, MINN.

and contains about 1,500,000 square miles. There is a small percentage of poplar, larch and a few other woods in this immense forest, but the majority of the trees are white spruce and black spruce. In the southern portion the timber is said to be of merchantable size but in the northern areas it is fit for pulpwood only.

Redwood for Conduits.

What class of wood makes the most satisfactory pipe for carrying water underground at high pressure?

The accompanying illustration shows a triple redwood pipe line installed near Duluth, Minn., by the Redwood Manufacturing Company, of Black Diamond, Cal., for the Great Northern Power Company, of Duluth. These lines are laid side by side in pipe 7 feet in diameter, nearly 2,000,000 feet of lumber having been used in their construction. Redwood lumber manufacturers claim that redwood is the most satisfactory for underground pipe lines owing to its well known resistance to decay.

Uses of Western Larch.

Please give a description of Montana larch or fir. Would it be suitable for flooring, trim or shingles?

Larch is one of the valuable timbers of the west, the structural field being its special sphere of usefulness. It is a dense, hard, heavy wood. The grain is close and the wood gives satisfaction when used for purposes which bring it in contact with the soil. The color of larch (*Larix occidentalis*) is a bright, light red. Until within the last year or so (1904) it was used largely for railway ties, fence posts and similar work. This member of the larch family reaches its highest development in the mountain regions in western Montana and Idaho. On account of the abundance of this timber it was used

for railway ties and bridge timbers early in the development of the west. Later it was manufactured into lumber and used for all manner of building purposes, including interior finish.

It required many years for operators to appreciate the value of larch, or tamarack, the name most commonly used in the middle north. Today the tamarack is brought to the mills cut into lumber, largely piece stuff, the smaller timber being hewn into ties in the forest.

Western larch makes excellent flooring, ceiling and interior finish. It is rather heavy for use in the manufacture of doors and hardly desirable for sash and similar purposes, though it is well fitted for manufacture into moldings.

It is well for eastern dealers to bear in mind that in some sections along the Columbia river, in Oregon, manufactured lumber shipped under the name of larch. It is cut from the best timber growing on the Pacific coast and just why the name larch was given to it cannot be explained. The timber is really a species of fir called silver or noble fir. The character of this product differs radically from that of the larch or tamarack of Montana. The latter is being used for flooring or structural work and the product of the silver fir is sold under the name of larch for exterior and interior trim.

White Cedar Distribution.

Please give me some information relative to white cedar timber of the United States, showing distribution, qualities and uses.

White cedar is a name that has been applied to so many of the resinous trees of this country that the term has become more or less indefinite and the purchaser, in order to know just what he will get, must know from what region his lumber comes. In the northern part of

the United States and in Canada the name of white cedar is applied to what is botanically known as *Thuva occidentalist*. The same tree in Maine is called the *Arbor vitae*. This is a very different article from the white cedar of the south. *Arbor vitae* does not, we believe, grow further south than the northern part of the state of Virginia, but some of it has been found in times past on the upper Potomac. It grows as far north as Lake St. John, Canada, and perhaps further. It flourishes in cold places and, like the white cedar of the south, develops most rapidly in a very humid soil. It is very large at the base. The trunk is very irregular in growth and tapers rapidly toward the top. Ordinarily its growth is exceedingly slow and the trunk is covered with branches about four-fifths of its length. It grows best on the edges of swamps and, where the bark is exposed to much sunlight, becomes very light in color. This wood was exported as white cedar and *Arbor ritae* as long ago as the early part of the seventeenth century and it is used now as then for boat building and for sundry other purposes.

Southern white cedar, or, botanically, *Cupressus thyoides*, also misnamed "juniper" in Virginia and North Carolina, where it grows and reaches its perfect state, is also a resinous wood and may be found growing as far south as Florida and also to some extent, although of a much poorer quality, in New Jersey and Maryland. At one time it covered a large portion of the lowlands of the latter two states. The name applied to it locally in Virginia and North Carolina, juniper, is misleading, as the tree belongs to a different genus from the junipers. Its name has no doubt been derived from the *juniperous Virginiana*, or red cedar, which also at one time abounded in these states and may

now be found to some extent in portions of North Carolina.

Southern white cedar still abounds in the great Dismal Swamp of Virginia and North Carolina and in a few counties of North Carolina further south which seem to have the same geological structure and formation. It grows only in wet ground. It reaches a height of seventy to eighty feet and has been known to attain a diameter exceeding three feet at the base. It has a fragrant, resinous odor and the wood contains an aromatic oil. This odor is retained for an indefinite number of years if the wood is kept dry, and on this account it has met with much favor for the manufacture of chests and of plastering lath for dwellings, rendering them mothproof. The wood is extremely light, of a soft, even grain and impervious to moisture, while possessing considerable strength. For this reason it is used largely for outer planking in the manufacture of the better class of yachts and small boats. In fact, so light is the wood and so impervious to moisture that the fishermen of North Carolina use it largely in place of cork for their seines and nets. It is manufactured into plank for large tanks and vats, for boat boards, for shingles, for roofs and sides of houses, for telegraph and telephone crossarms, poles etc., and is made into buckets, tubs, churns and various household articles because of the fact that it is not affected by alternating dryness and moisture. It is owing to this quality that the United States government specifies white cedar shingles for its coast life-saving stations. As a wood for boat building it has been used for over 100 years and has been employed extensively for this purpose since the beginning of the last century, selling at that time for \$20 a thousand feet. About that same time shingles were made from the wood in the oldfashioned way by means of a froe

and drawing knife and were exported to the West Indies and elsewhere.

It is no uncommon thing to find rail fences that were built of cedar fifty to sixty years ago. The wood takes on a silver gray color when exposed to the weather, which color it retains in a very fine film on its outer edge, while beneath it remains as bright as the day it was cut.

While the demand for white cedar from the south is steadily improving the supply is limited. Its value, known to a few for many years, is gradually becoming recognized by those requiring a wood of these qualities. The business of its manufacture has been increasing rapidly for the last five years. So long as the wood can be procured it will be used for the manufacturing purposes named. Its friends enthusiastically declare that there is no other tree that grows which is comparable in quality to the white cedar of the south—the *Cupressus thoides*.

Distinction Between Big Tree and Redwood.

Is there any distinction between the "big tree" of California and the California redwood?

The redwood and the "big tree" are of the same genus but not the same species. The botanical name of the "big tree" is *Sequoia Washingtoniana* (Sudworth), or *S. wellingtonia* (Sargent), while the redwood is known as the *Sequoia sempervirens*. The former is much the larger but the redwood is far more important considered as a commercial timber, as the "big trees" are not numerous, are found only in scattered groups and are too large to be handled to advantage. The redwood is confined to the coast region, while the big tree grows in the interior along the western slope of the Sierra Nevadas.

Incense Cedar.

Where does the incense cedar grow and what kind of wood is it?

The incense cedar is one of the valued trees indigenous to the California coast, the mountain region of that state and southern Oregon. It grows very rapidly and reaches a height of from 100 to 200 feet, ranging in diameter from six to nine feet and sometimes greater. The shaft is often clear of limbs for eighty to 100 feet. The wood is exceedingly light and soft but very durable.

Georgia Pine and Synonymous Terms.

We would like to get some definite idea as to the difference between longleaf and shortleaf yellow pine. Which is the best adapted to moldings? Is there any difference between yellow pine and Georgia pine?

We occasionally have customers that have used what they call Georgia pine. We sell them yellow pine in place, but many of them seem to have doubts as to it being the same or as good as Georgia pine.

It is not surprising that more or less confusion exists in the public mind in regard to the various names given southern or yellow pine. The pine forests of the south are composed of four principal species; these are longleaf (*pinus palustris*), shortleaf (*pinus echinata*), Cuban (*pinus cubensis*) and loblolly pine (*pinus tæda*). Perhaps the bulk of the pine of the southern states is composed of the two species first named—longleaf and shortleaf. Cuban pine affects the coast and is found largely in Georgia, Florida and to a great or less extent on the Gulf coast. Loblolly bears the same relation to longleaf and shortleaf pine that bull pine does to the white pine of the north and it is sometimes known as bull pine. It has a very coarse grain and contains more pitch than either longleaf or shortleaf.

Longleaf pine grows in dense, unbroken forests, preferably on level sandy stretches, and is not mixed with other kinds of timber. It comprises the bulk of the pine in Georgia and is also found in Carolina, Florida, Alabama, Mississippi, Louisiana and Texas. In typical specimens of longleaf the light wood, representing the summer growth, and the dark wood, the winter growth, are about evenly divided. It is the strongest of the southern pines and is considered the best for structural work, car sills and similar purposes. It is also one of the best flooring materials for either residence or factory floors that have ever come into general use. Much of the longleaf yellow pine flooring is quarter or rift sawed and makes a very substantial and enduring floor.

Shortleaf pine as a rule is found farther inland than the longleaf. It may be said to comprise the third tier of southern pine; first, Cuban pine, along the coast; second, the longleaf pine next to the Cuban, and then the shortleaf pine, extending still farther inland. In some states a body of shortleaf alternates with one of longleaf, but except at the meeting point the two pines do not grow together. Shortleaf pine and hardwoods often are found intermixed. In some districts in Arkansas the proportion of hardwoods to pine is about one to five. As a rule the shortleaf affects higher grounds and locally is sometimes known as hill timber; it is lighter in both color and weight and contains a greater percentage of summer growth wood; it is easier to work than the longleaf and makes a satisfactory lumber for finishing, siding and moldings and in the southern and central states lately is coming into favor as a shop material, though progress along this line has been made more slowly apparently than the character of the wood would justify.

As between longleaf and shortleaf pine for moldings shortleaf is recommended, though perhaps there are in-

stances when this recommendation might not hold good. Many of the large manufacturers in the south have facilities for furnishing either longleaf or shortleaf and it is optional with the buyer which kind shall be shipped.

Georgia pine is longleaf (*pinus palustris*). The longleaf pine timber of Florida, Alabama, Mississippi, Louisiana and Texas differs in no particular from that of Georgia and it is generally understood by lumber manufacturers and users that these two names specify the same wood. Georgia pine is a local cognomen tacked on to *pinus palustris* simply because the first extensive manufacture of longleaf pine was begun in Georgia. It is perhaps safe to say that little if any Georgia pine comes west of Cincinnati. Architects continue to specify it in western cities, because their textbooks give that name to *pinus palustris*, which is suitable for certain purposes. Authoritative confirmation of this statement has been given by the courts of the country, which have held in cases brought before them that Georgia pine meant longleaf pine regardless of where the lumber originated.

There is no difference in the quality of longleaf pine from Georgia and that from other districts providing, of course, the stock supplied is well manufactured and has received the necessary consideration during the time it was being cured. A great amount of pine has been cut in localities far distant from Georgia and been offered and sold as Georgia pine, and properly so under the construction placed upon the term by botanists and the courts.

Speaking in a general way it may be said that the territory from Chicago west draws its southern pine supplies from the mills in Mississippi, Louisiana, Texas, Arkansas and Missouri. There is, of course, no rigid line where the use of this lumber ceases and that from

another district begins. From the five states named can be secured both longleaf and shortleaf pine, either one of which would fulfill the specifications of yellow pine and one of which—longleaf—would answer for Georgia pine.

If the correspondent will bear in mind that yellow pine and southern pine are collective terms and that longleaf, shortleaf and Georgia pine are specific terms his understanding in regard to the pines of the southern states will be more complete and of greater value.

Reproduction of Redwood.

I am interested in redwood timber in California, in a small way, and would like to know if there is a second growth of this timber.

Redwood forests are composed of matured timber. Little if any growing timber is found in the dense redwood groves. Practically all of it is of commercial size.

As soon as this timber has been removed, however, from the stumps of the ancient trees there springs up a heavy growth and it is from this source, rather than from reseeded, that the country is to be reforested. At one place where logging operations were under way a picture was secured of the young redwood shoots that had grown up since the tract had been cut over. These shoots were about six weeks old or, rather, the tract had been burnt over six weeks previous. The shoots or suckers then were eighteen inches to two feet high, had a healthful color and were growing vigorously. Redwood suckers eight years old range from ten to twelve inches in diameter, and twenty to thirty feet high. With a little care and a little expense in cutting away a part of the suckers, leaving probably two or three to each stump, the growth would be even more rapid and the

results secured more than proportionate to the amount expended in such care.

Timber land owners in Humboldt county, California, have endeavored to stamp out this second growth in order that the land might be used for grazing purposes. It is necessary to cut the sprouts four to six times before the growth ceases, and even then an occasional sucker shoots up and attains a vigorous growth.

During the centuries which these great monarchs have lived, a perfect system by which nourishment is furnished the huge trunks is established. When the great body of the tree is removed these channels for supplying nutriment or the substance which gives life to the trees does not die and it is due to this fact that the second growth is so prolific and long continued. In various parts of the redwood districts the new timber has been utilized—mainly for piling—and a good profit realized from its use.

Virginia Sap Pine.

What is Virginia sap pine?

The second and third or even the fourth growth of what is commercially known as North Carolina or loblolly pine is called Virginia sap pine. In southeastern Virginia, notably in the James river district, this growth reproduces itself rapidly and is cut into lumber by the small mills. It is a fast growing wood with but little heart, and consequently much inferior in strength to the original growth.

Cypress Called Redwood.

Has southern cypress ever been called redwood?

Yes, but so long ago that neither wood will start a quarrel or be called upon to apologize to the other.

In 1765 the "Gentleman's Magazine" for August contained this statement: "A quantity of exceeding fine redwood, the produce of east Florida, is said to have been sold in Charleston, in South Carolina, at 21s' currency a cube foot."

DISTRIBUTION.

Timber of Smoky Mountains, North Carolina.

What varieties of timber are found in the Smoky mountains in North Carolina?

In the order of their value they are yellow poplar, white oak, red oak, chestnut, white pine, yellow pine, spruce, cherry, birch, ash and hemlock. The local name for hemlock is spruce pine. Chestnut bark is used for tanning, selling for about \$7 a cord, while hemlock is worth but \$5 (1905 prices).

Absence of Tree Growth on Western Prairies.

What is the explanation of the absence of tree growth on the great prairies of the west?

According to a theory exploited at a meeting of the Academy of National Sciences, the American Indians annually fired these prairies, with the idea of increasing the luxuriance of the prairie grass which furnished the food for the buffalos upon which the Indians preyed. No other vegetable growth but the hardy grass of the prairies would grow upon land annually ravaged by fire, which explains the absence of trees upon these immense areas.

This, of course, is merely a theory, but it appears to be substantiated by the fact that since the settlement of the western plains by white men thousands of

trees have been planted, which have grown as well as trees planted in any other section of the country. Another theory, supported by eminent authorities, is that the primary cause is lack of sufficient rainfall, or its proper distribution through the year so that trees were not able to resist other unfavorable influences; while their present extension is due not only to protection against fire, but to an increase in humidity resulting from cultivation under civilized occupancy.

The destruction of vegetable growth by glaciers and the effect upon precipitation and wind of the surrounding mountains are other causes.

Timber of Hudson Bay Country.

What kinds of timber abound in the Hudson bay country?

The expression Hudson bay basin does not mean merely the bay and its coast lines but all the surrounding territory, amounting to 1,500,000 square miles, about equal to one-half the land area of Canada. This land is at present a closed book, as outside of the route through Hudson strait there is not a single commercial highway into it. Canoes and dogsleds remain the means of transportation but the resources of the district are worthy of better facilities. The following is a list of the forest trees of the Hudson bay district arranged in the ascending order of their northern limits:

White elm—Found only in the most southern portion of the district, its extreme north limit, east of Lake Winnipeg, being about latitude 51 degrees; not very abundant.

White pine—Found only as far north as latitude 52, in the neighborhood of Lonely Lake. Common and of fair size, about the head waters of the branches of the Moose river.

Red pine—About the same as white.

Black ash—Found as far north as latitude 53, toward Lake Winnipeg, but only 50 degrees toward James bay.

Common on the various branches of the Moose river but of small size.

Cedar—Found as far north as the mouth of the Rupert river on James bay, along the Moose and Albany rivers around Lake St. Joseph, and Cedar lake, on the Saskatchewan river, being in about latitude 53 deg. 40 min. Many trees are of large size, though not very abundant.

Banksian pine, or jack pine—Extends as far north to the east of James bay as latitude 55 degrees, and trees of good size are abundant throughout this western part of the Labrador peninsula. To the west of Hudson bay the range of this tree extends much further to the north, having been discovered at the north end of Selwyn lake in latitude 60 deg. 30 min., and at the northeastern extremity of Great Slave lake in latitude 62 deg. 45 min. Dr. Bell reports it as being abundant and of large size in the valley of the Albany river.

Balsam fir—Northern limit on east side of James bay, at Great Whale river. To the west it crosses the Nelson river at about latitude 55 deg. and then turns in a northwesterly direction toward the mouth of the Athabasca river. The tree is common below this limit, though not very abundant.

Canoe birch—One of the most common and valuable forest trees of northern Canada. In the Labrador peninsula it extends as far north as Great Whale river; is very common south of this, but not of large size, commonly not over six inches in diameter. West of the bay the limit extends in a northwesterly direction, passing a little north of Selwyn lake.

Aspen, or common poplar—Has about the same northern limit as the birch and is the most widely diffused tree of North America. It is very abundant within its range throughout the Hudson bay district and is one of the most valuable of the forest trees, being commonly as much as 10 or 12 inches in diameter.

Balsam poplar, or balm of Gilead—Extends considerably further north than the white poplar, but is much less common. East of Hudson bay this tree is found as far north as Richmond gulf. West of the bay it disappears near Fort Churchill, and thence its limit extends in a northwesterly direction, about parallel with those of the other northern trees.

American larch or tamarac—This tree is the rival of the

spruce in the range to the northward and, as regards abundance, it stands second only to the black spruce. It is usually the largest tree of its neighborhood. It attains a fine growth throughout many parts of the country, south and west of James bay.

Black spruce—Is by far the most abundant tree in the Hudson bay district, forming possibly 75 percent of the whole forest; as a rule too small for the manufacture of lumber.

White spruce—Though much less abundant than black, is very common everywhere throughout the forests of the Hudson bay district. Its northern limit, which is about the same as the black spruce, is on the east side of James bay, in about latitude 57 deg., a few miles north of Richmond gulf. On the west coast of the bay the limit extends to latitude 59 deg., at the mouth of the Seal river; thence it extends in a northwesterly direction, passing close to the mouth of the Copper Mine river, and on to the mouth of the Mackenzie river.

Classification of Western Woods.

For my information will you kindly classify western woods now being offered to the eastern trade?

There is considerable confusion, not alone in the minds of the eastern buyers but along the coast as well, as to classification of the various woods of the Pacific coast district. As an instance, in California everything that comes from Oregon and Washington is known as "Oregon pine." In the majority of cases such shipments are composed of fir, but mixed in will be found a sprinkling of spruce, hemlock and other woods. When the product of the Northern Pacific states comes east it is variously termed fir, white pine, western pine, cedar, spruce etc.

There are a number of important timbers found in the western states. Those, according to states, which have been used up to the present time and which form a large part of the mills product are: Washington—fir,

spruce, cedar; Oregon—spruce, cedar, fir, pine; Idaho and Montana—larch, cedar and pine; California—fir, pine, redwood, with other minor woods in each state.

The fir timber of Washington is composed principally of the Douglas or yellow fir and the red fir. It is claimed by many that the variation between the red and the yellow fir is merely incident to the location of the tree; by others it is said they are different varieties of the same species of the conifer family. The purposes for which the manufactured product is adaptable are much the same and the character of the woods is so closely allied that it is not necessary to make any distinction between them. The red cedar of Washington has such a distinct individuality that substitution is impossible and in this consideration of the woods it may be dismissed.

There is a distinct line of demarkation between the fir and spruce of Washington but no such difference exists between the spruce and the hemlock, hemlock being found in large quantities mixed in with other woods. The hemlock (1905) is being manufactured to a limited extent and sold under different names, sometimes as pine and sometimes as spruce. As a general thing the purchaser is none the wiser, and in view of the splendid quality of hemlock that grows in that state, differing materially from that of the east and closely resembling spruce when manufactured, it is not absolutely necessary to make a distinction between the two woods and in fact little is being made.

In Oregon is found the lower fringe of the red cedar belt, the timber differing in no particular from that in Washington. The spruce growth of the west reaches its highest state of perfection near the mouth of the Columbia river and extends south and north along the coast. This wood is coming into general favor in the manufac-

ture of doors and as a box, crate and shop material. In central Oregon Douglas fir gives place to pine and in the southern and eastern part of the state are found magnificent forests of sugar, white and other pines.

In the pine belt of California are found fir, a sprinkling of cedar, sugar pine, white pine and other varieties. The redwood of California, as the red cedar of the north, by reason of its color proclaims itself wherever it may be found. In Idaho and Montana are found various species of pine, larch and cedar.

This in a general way is the manner in which the forests of the west coast are populated, and it is no wonder, therefore, that great confusion exists in the minds of not only the eastern trade but of the manufacturers as well with respect to the classification of the various woods.

The average eastern lumberman who visits Washington and Oregon and lands in San Francisco cannot understand what wood is meant when "Oregon pine" is spoken of. He does not know whether it means the pines from the southern or eastern part of the state or whether there are some other districts with which he is unacquainted. He has learned to associate the product of the Washington and Oregon mills with the proper name—fir—and does not recognize it when called "pine."

This interchangeable use of names is well understood along the coast and is generally employed. The manufacturers in Oregon and Washington understand it so thoroughly that they know exactly what is wanted when a requisition for Oregon pine is made. There is no such understanding on the part of the eastern buyers, and while shipments east are not dubbed Oregon pine there are substitutions of names and woods that create even greater confusion than this local blanket appellation

which is thrown over the products of Oregon and Washington.

Quantity and Cut of Red Cedar, Poplar and Cypress.

Will you kindly send us the following information at your earliest convenience?

First—Total stumpage now standing of red cedar, poplar and cypress. If you have not the present stumpage, please give that for as late a date as you may have it.

Second—The annual cut of the above woods for 1902 and 1903. If not able to give us that, 1900 and 1901 will suffice.

According to the geographical survey red cedar comprises 16 percent of the timber of Washington west of the Cascade range. Even with this as a basis of computation it is not altogether satisfactory to endeavor to approximate the present amount of standing red cedar in Washington and Oregon. It is perhaps safe to say that northwestern Oregon and that portion of Washington lying west of the Cascades contain at this time, on the present basis of estimating, 200,000,000,000 feet of timber of all kinds. Figuring in this manner would give 32,000,000,000 feet of red cedar, which is probably as near to the actual amount as can be stated with any degree of certainty. The percentage of red cedar secured from the operations of the logging companies varies in different localities. In some parts of Washington the cedar comprises as much as 80 percent of the total stand and from this the amount shades down until in some districts only an occasional tree is secured. In California, eastern Washington and Idaho and possibly Montana is found a cedar which by some is termed red cedar and which does not grow in large quantities but which doubtless should be figured in as a part of available red cedar timber, as it is used for the same purposes.

Poplar does not grow in compact bodies but is found

intermixed with other hardwoods. Usually it is cut at the same time the other woods are secured. The yield varies greatly. On account of the scattered nature of its growth it is difficult to estimate what a given tract will yield without carefully considering what each tree would make. Of late years manufacturers are using a quality of poplar logs which in earlier times was not available. This condition has been brought about by appreciation in the price of the manufactured article and an increased demand for lower grades of lumber.

Cypress is found fringing the south Atlantic and gulf coasts, from the Neches river in Texas, east along the gulf and north along the Atlantic as far as Maryland. Along the Mississippi cypress is found as far north as Missouri and grows in considerable quantities in the southeastern portion of that state, as also in northeastern Arkansas. The bulk of standing cypress timber today is in Louisiana, where it is found in large quantities covering many square miles, with occasional interspersions of gum and other hardwoods and pine on highlands.

In Louisiana alone are a number of concerns which estimate their stumpage around the billion foot mark and in addition to these are other manufacturers owning from 100,000,000 feet to 600,000,000 feet of timber. It is possible that the amount of cypress remaining uncut in Louisiana will range between 8,000,000,000 and 9,000,000,000 feet, though these figures may be regarded as correct only in a general way.

In 1900 the census bureau accounted for 6,562,000,000 feet of cypress owned by lumbermen. It was stated at that time that this probably did not represent more than 10 percent of the total stand. This would give a total of 65,620,000,000 feet of cypress in 1900, from which has been deducted the amount that has been cut during the last five years. This approximation, however, un-

doubtedly is too liberal. If, as is contended on reasonable grounds, the bulk of the cypress timber is in Louisiana and that state does not now contain to exceed 10,000,000,000 feet at the outside, the 1900 estimate of the census bureau is at fault. The census report for 1899 showed that in North and South Carolina, Florida and Arkansas about as much cypress timber was owned by manufacturers as in Louisiana. If this may be regarded as a criterion it would perhaps be safe to say that there is remaining in the various other southern states as much cypress as in Louisiana, which would make the present stand in the neighborhood of from 17,000,000,000 to 18,000,000,000 feet. Taking into consideration the many isolated tracts in the various states these figures may be regarded as representative.

The most complete figures that can be given for the production of these three woods are those contained in the census returns of 1900 showing the output of 1899. The total production of poplar during the year stated was 1,115,242,000 feet. It is not shown that there has been any decrease in the output of poplar nor, on the other hand, has there been any considerable increase, as the production of poplar has about reached its high and by those who are in close touch with the poplar situation it is generally thought that from this time on the annual product will show a slight though steady decline.

In 1899 was reported to the census authorities a total cut of 495,836,000 feet of cypress, of which Louisiana contributed about 50 percent. The production of cypress during the last five years has increased at a wonderful rate and, estimating the total cut at about three times what it was in 1899, approximately 1,500,000,000 feet probably is not far out of the way and it is perhaps safe to assume that Louisiana still contributes 50 percent of this amount. In the cypress as in the poplar

field, however, production has about reached the high limit and it is doubtful if it will be increased to any material extent, though it will continue at the present ratio for several years at least. The bulk of the standing timber is in the hands of manufacturers who operate large mills for its conversion into lumber and are content to satisfy the continually increasing demands for their products and are not disposed to put it on the market any faster than it can be absorbed.

The total cedar product in 1899 was 232,978,000 feet; this included the white cedar of the north as well as that of the coast. In 1903 was reported to the AMERICAN LUMBERMAN a cut of 121,342,000 feet of red cedar lumber from the Washington mills alone. The Oregon mills reported a cut of 18,441,000 feet. The total cedar output of the six western states was reported as 146,708,000 feet in 1903 and 234,529,000 in 1902. In addition to this, however, was a shingle product of 6,060,945,000 pieces in 1903, which would materially have increased the cedar output had this timber been converted into lumber instead of shingles.

Supplemental to the figures given are those which the LUMBERMAN has compiled for 1904. The total cedar product of five states in 1904 was 323,431,000 feet, of which Washington contributed 286,109,000 feet. To this is to be added a shingle product of 7,184,173,000 pieces, of which Washington mills manufactured 6,469,551,000 pieces, all of which were red cedar, and Oregon contributed 55,064,000 pieces, a total for the two states of 6,524,615,000 shingles, equal to probably 650,000,000 feet of lumber and making the total production of cedar for the year approximately 1,000,000,000 feet.

Estimates of standing timber are approximated and the usual formula is to say there is so much hardwood and so much pine or coniferous timber. As to the ex-

act amount of any wood there is no means of ascertaining.

The Cedars of North America.

How many varieties of cedar are there in North America, and where do they grow?

The name of cedar is given to a number of trees belonging to several different genera and many distinct species. The cedar most commonly known as such to the lumber trade is the *Thuja*, which is commonly known as the arborvitæ by botanists in order to avoid confusion with other species known as cedars. The genus *Thuja* has two species of commercial value—*Thuja occidentalis*, the white cedar of lumbermen, and the arborvitæ of botanists, and *Thuja plicata*, the red cedar of Washington, also known as canoe cedar, called giant arborvitæ by scientists. These two are the most important of the so-called cedars of the United States.

The range of the white cedar is from Nova Scotia and New Brunswick, northwestward to the mouth of the Saskatchewan and southward through the northern states to southern New Hampshire, central Massachusetts and New York, northern Pennsylvania, central Michigan, northern Illinois and central Minnesota, and along the high Allegheny mountains to southern Virginia and northeastern Tennessee. It grows in cold, wet swamps and along the rocky banks of streams. The wood is very light. White cedar is not strong, has a coarse grain but is very durable when placed in contact with the soil. It is light brown in color but turns darker when exposed to the weather. The thin sapwood is nearly white.

The red cedar of Washington, or canoe cedar, is found from Alaska southward along the coast ranges of British Columbia, western Washington and Oregon,

where it is the most abundant and grows to its largest size, and through the California coast region to Mendocino county, spreading eastward along the interior ranges of British Columbia to the western slope of the continental divide, and along those of northern Washington and Idaho to the mountains of northern Montana. This cedar is a light, soft wood and, like the white cedar, is very durable when placed in contact with the soil. The color is a dull brown tinged with red, with the sapwood almost white.

Among the other so-called cedars of commerce the best known is the red or pencil cedar of the south, the scientific name of which is *Juniperus barbadensis*. It is used in the making of lead pencils to the practical exclusion of other woods. The range of this species is inundated river swamps from southern Georgia, southward to the shores of the Indian river in Florida, and on the west coast of Florida from the northern shores of Charlotte harbor to the valley of the Apalachicola river, often forming great thickets under the shade of larger trees; common on the Bahamas, San Domingo, the mountains of Jamaica, and Antigua.

Another white cedar is indigenous to the Atlantic and eastern coast states. This is *Chamæcyparis thyoides* and its range is the coast region from southern Maine to northern Florida and westward to the Pearl river in Mississippi.

A third white cedar is confined to Oregon, California western Nevada and Lower California. This is *Libocedrus decurrens*, incense cedar, also known as post cedar and white cedar.

The genus *Chamæcyparis*, mentioned above, has a other species also known as white cedar—*C. lawsonia*—or Port Orford cedar. It is confined to the co:

region of Oregon and California. It is a light, strong, hard wood and easily worked.

Besides those mentioned above there are many trees that are known as cedar in certain states or sections. Among them are seven species of *Juniperus*, one of *Chamæcyparis*, one of *Tumion* (not a conifer)—the stinking cedar of Florida—and one of *Cupressus* (cypress).

The United States Forest Service has adopted the following nomenclature: White cedar and Washington red cedar it calls arborvitæ; the cedars of the *Juniperus* genus it calls junipers; to those of the *Chamæcyparis* genus, including the Atlantic coast white cedar and the Pacific coast Port Orford cedar, it limits the application of the name "cedar."

Timber in Northern California.

What are the principal kinds of timber in northern California and what is the average log contents, the acreage, log lengths etc.?

The timber in the Mount Shasta district comprises five principal woods—sugar pine, white pine, red fir, white fir and white cedar. The sugar pine amounts to 15 or 20 percent of the timber. The sugar pine of this district sometimes obtains a diameter of eight feet. It is of slower growth than the yellow pine and a tree five feet in diameter would probably be 900 to 1,000 years old. One peculiarity about the pine district of California is that the second crop of timber largely is pine. In the old northern pine districts the second growth usually is hardwood.

The red fir cut probably will average 750 feet to the log. Sugar pine will produce about the same amount. Yellow pine, however, varies and the average is lower, as there are more small trees of yellow pine than sugar

pine and a conservative estimate places the average amount of lumber contained in each log at about 500 feet. White fir is given very little consideration in this district and does not receive the attention that is given any of the other woods. There is a considerable amount of white fir cut, however, which is used for sticking the lumber, for building plank roads and alleys and for covering the stock. The average white fir log will produce probably 250 feet. The white cedar found in California is peculiar to that region. There are three cedars growing on the coast, the red cedar of Oregon and Washington, the white or cream cedar of the Coos bay district of Oregon, and the white cedar of northern California, which bears a close relation to the white cedar found in Wisconsin and Minnesota. Another timber native to this district, which grows in commercial quantities, is the bull pine, which bears the same relation to the white pine of the coast as does the swamp or loblolly pine to the southern pines. It runs largely to clears but the grain is coarse and the wood is not as desirable as either the sugar or the white pine. It might be termed as a cross between the other two species and is to be found largely on cut over lands.

Timber of the Pacific Coast.

What proportion of the timber supply of the United States is located on the Pacific coast?

Oregon, Washington and California are estimated to contain nearly one-third of our timber supply. The quantity of standing timber there has been estimated at 600,000,000,000 feet, composed of various kinds of soft woods many of which are common to all three states, fir and pine taking the leading places. Fir mingles with pine, redwood, spruce and cedar, but western pine does not mix with other timber. Oregon

contains more merchantable timber than any other state in the union, and 57 percent of the area of the state is classified as timber land. In this state is located the Cascade Range forest reserve, containing 7,020 square miles, or 4,492,800 acres. The amount of timber in the reserve is estimated at 20,000,000,000 feet. With its enormous timber supply, Oregon has not come forward as a great manufacturing state and the lumber industry is yet in its infancy.

Heaviest Growth Timber.

Will you please send me some data of largest lumber yields to the acre in this country? 'Tis for a friend in Paraguay who, maybe, wants to boast. He asks for number of thousand feet to the acre and length of time required to cut.

The section which yields the greatest amount of lumber to the acre in this country is the coast redwood district of California. There have been instances of small tracts that have produced as much as 1,000,000 feet of lumber to the acre and there is timber still standing in the district in question from which there can be cut that amount. From a tract of 4,000 acres there was cut an average of 75,000 feet to the acre, log measure at the mill, and there doubtless was allowed to remain in the woods 15,000 to 20,000 feet which at the time the trees were cut was not considered worth transportation.

The average in the fir district of Washington is probably not more than 25,000 feet to the acre, though eighth and quarter sections have been cut which produced as much as 75,000 to 80,000 feet.

The pine regions of the west vary too greatly to set any general average, but there are districts where the growth is very heavy and where probably 30,000

to 40,000 feet to the acre from small tracts could be secured.

In the southern pine territory, notably the longleaf districts of Louisiana, as much as 25,000 to 30,000 feet has been cut from one acre, and in the old northern white pine sections "forties" have been known to produce an average 50,000 feet, or over 2,000,000 feet to the forty.

The hardwoods of the middle states grow in scattering clumps and it is difficult to give any approximate average for any section.

British Columbia's Timber Resources.

Can you give me a definite idea of the timber resources of British Columbia?

No definite information as to the amount of timber in British Columbia is available. The character of the timber in this province is very similar to that of Washington and in a rough way it has been estimated that the amount of standing timber in each is about the same. If this is true there is standing in British Columbia in the neighborhood of 200,000,000,000 feet. Along the coast in the western part of the province the timber is composed very largely of fir, red cedar, some spruce and hemlock. In the eastern part the timber is largely pine, mainly what is known as western yellow pine.

According to the records of the Pacific Coast Lumber Manufacturers' Association British Columbia has fifty-four saw mills with an aggregate capacity of 1,350,000 feet a day. No record has been kept showing the amount of lumber cut, the amount shipped by rail to eastern provinces and the states, the quantity used locally and the volume of the cargo trade. Partial records show that in 1902 cargo shipments from Brit-

ish Columbia amounted to 55,443,448 feet. One of the oldtime lumbermen of the Pacific coast stated that there was produced in the province in 1902 525,000,000 to 550,000,000 feet and that there was accounted for 275,000,000 to 300,000,000 feet of lumber, no record being available to cover the difference. In view of the conservative nature of the figures submitted by the statistician on the lumber production of Washington and Oregon it perhaps would be safe to double the total given and that would make the production in British Columbia in the neighborhood of 1,100,000,000 feet. In 1903 the returns showed rail shipments from British Columbia aggregating 75,000,000 feet and cargo shipments of 62,238,684 feet, but these are figures supplied by very few of the fifty-four mills in the province—probably not more than 10 percent of them—but it should be borne in mind that these figures represent the lumber cut by the larger mills and probably are in excess of the prorata cut and shipment.

The figures given here are largely the result of conjecture.

Timber of Mexico.

Please describe the pine which is to be found in Mexico, giving its location, and any other information you may have.

A mixture of yellow and white pine is found in the higher altitudes of Mexico. The timber is much the same as that found in Arizona and New Mexico. The yellow pine is free from shake, with small black knots, and is neither as heavy nor as hard as the yellow pine of the south. The white pine is closely related to the western sugar pine, having the peculiar black specks which distinguishes western white pine from that of the north. Mexican pine is found in the northern

states of the republic and in the higher altitudes of the south. While it is considered a valuable timber at present, it can be secured on very reasonable terms because it is out of reach of the railroads and probably will not be available for manufacturing for many years. The Mexican government has compiled very little information regarding the pine timber resources.

Pine Timber of Bahama Islands.

Is there any pine growing in the Bahama islands?

Several years ago American cruisers went to the Bahama islands and there found considerable quantities of what closely resembled norway pine, although it was a little smaller and finer grained than the norway of the United States. The best timber was located on Grand Abaco, Great Gahama and Andros islands.

Pine and Hardwoods on the Isle of Pines.

Is there any merchantable timber on the Isle of Pines?

According to official reports the Isle of Pines is timbered with yellow pine, mostly small trees, but containing some fair merchantable timber. The southern portion of the island is said to contain considerable mahogany and other valuable hardwoods.

Pine Resources of Eastern Canada.

How much pine is there in the eastern provinces of Canada?

According to estimates made in 1903, and which are considered reliable, Ontario, containing 38,808 square miles, had 19,404,000,000 feet of pine timber. Quebec, with 31,468 square miles, had 15,734,000,000, while the

maritime provinces, aggregating 22,027 square miles, were credited with a total of 2,200,000,000, giving a grand total of 37,338,000,000. These estimates are based on timber twelve inches and up in diameter. If brought down to 8-inch trees the amount would be largely increased.

Timber Resources of Alaska.

What are the timber resources of Alaska?

The area of merchantable Alaskan timber lies in the southeastern part, the trees gradually growing smaller as the northern limit of the territory is approached. Spruce, yellow cedar, red cedar and hemlock are the principal trees. Some of the spruce trees are said to be very large, scaling 7,000 feet or more. In the valleys there is considerable cottonwood and birch.

Timber Resources of Eastern Siberia.

Can you give me an idea of the timber resources and lumber manufacturing industry of eastern Siberia?

Not a very complete one because definite information in regard to timber in Siberia never has been compiled and the manufacturing industry is yet in its infancy. Those familiar with affairs in the orient and eastern Russia are inclined to discount the amount of timber in that part of the world. A student who spent several years in the east gives this outline of the timber resources:

Only a small proportion of Russian requirements are satisfied with the products of the Russian mills. I believe Russia will continue an important buyer of American lumber, particularly of Oregon pine. With respect to the timber resources of the east, that belt extending over 200 miles along the course of the Usuri river from Vladivostock to Khaborob at its junction with the Amur, is the largest. This

great timber belt contains something like 300,000 square miles and corresponds very closely to the timber belt in Oregon from the Siskiyou mountains to the Columbia river. Like Oregon timber it is protected from the severity of the coast winds by an intervening mountain range.

The severe winters in the east limit the operations of logging camps and saw mills and labor is poor and of insufficient supply.

Their method of measuring is very peculiar. Their unit is the sarzjen; equivalent to seven feet, and all their logs are cut into three sarzjen lengths which limits the use of the lumber into which they are manufactured. It is impossible to get the Russian manufacturers to change their methods, just as impossible as it would be to have our manufacturers governed by them.

During the time I was in the east I sold an average of about 70,000,000 feet each year; competitors, I think, sold about 30,000,000 feet and the local production from Siberia was not to exceed 10,000,000 feet.

Prince Edward Island Timber.

Is there any timber on Prince Edward island?

Prince Edward island, located in the gulf of St. Lawrence about nine miles from the New Brunswick coast, originally was covered with a considerable growth of trees. Now, however, the island contains only 797 square miles of woodland out of an area of 2,184 square miles. In 1903 the legislature created a forestry commission, which hopes to do much in the way of reforesting the denuded areas and preserving what remains of the timber.

Weights of Commercial Woods.
What are the weights and specific gravities of commercial woods?

POPULAR NAME—	Botanical name.	Specific Gravity, dry.	Weight per 1,000 cubic ft., ft. B. M. pounds.	Weight per 1,000 cubic ft., ft. B. M. pounds.
Big Laurel.....	<i>Magnolia latifolia</i>	0.8360	39.70	3,308
Cucumber-tree.....	<i>Magnolia acuminata</i>	0.4890	29.28	2,440
Yellow poplar.....	<i>Liriodendron tulipifera</i>	0.4230	26.40	2,200
Basswood.....	<i>Tilia americana</i>	0.4525	28.24	2,355
Lignum-vite.....	<i>Guaiacum sanctum</i>	1.1432	71.36	5,947
Mahogany.....	<i>Suaeda mahogoni</i>	0.7382	45.45	3,788
American holly.....	<i>Ilex opaca</i>	0.5318	36.32	3,026
Broad-leaved maple (Pacific coast).....	<i>Acer macrophyllum</i>	0.4809	30.64	2,553
Sugar or hard maple.....	<i>Acer saccharum</i>	0.6912	43.15	3,595
Soft maple.....	<i>Acer saccharinum</i> , or <i>A. dasycarpum</i>	0.5269	32.89	2,740
Box elder.....	<i>Acer Negundo</i>	0.4328	27.01	2,251
Locust.....	<i>Robinia pseudacacia</i>	0.7333	45.77	3,814
Honey locust.....	<i>Gleditsia triacanthos</i>	0.6740	42.07	3,506
Sweet or red gum.....	<i>Liquidambar styraciflua</i>	0.5910	36.89	3,074
Boxwood.....	<i>Cornus florida</i>	0.8153	50.89	4,240
Tupelo.....	<i>Nyssa sylvatica</i>	0.6353	39.66	3,304
Madrona.....	<i>Arbutus aquatica</i>	0.5194	32.42	2,702
Chittimwood.....	<i>Bumelia lanuginosa</i>	0.7052	44.02	3,668
Persimmon.....	<i>Diospyros virginiana</i>	0.6544	40.85	3,404
White ash.....	<i>Fraxinus americana</i>	0.7908	49.36	4,113
Black ash.....	<i>Fraxinus nigra</i>	0.6543	40.84	3,403
Western catalpa.....	<i>Catalpa speciosa</i>	0.6318	39.44	3,286
Lancewood.....	<i>Ocotea catesbyana</i>	0.4165	26.00	2,167
Sassafras.....	<i>Sassafras sassafras</i>	0.7693	48.03	4,003
California laurel.....	<i>Umbellularia californica</i>	0.5042	31.47	2,620
Slippery elm.....	<i>Ulmus fulva</i>	0.6517	40.68	3,390
		0.6956	43.42	3,618

POPULAR NAME—	Botanical name.	Specific Gravity, dry.	Weight per 1,000 cubic ft., ft. B. M. pounds.	Weight per 1,000 pounds.
White or water elm.	<i>Ulmus americana</i>	0.6508	40.61	3,354
Rock or hickory elm.	<i>Ulmus racemosa</i>	0.7263	45.34	3,778
Hackberry	<i>Celtis occidentalis</i>	0.7287	45.49	3,790
Osgae orange, Bols d'Arc.	<i>Tosylon pomiferum</i>	0.7736	48.29	4,024
Sycamore	<i>Platanus occidentalis</i>	0.5678	35.44	2,953
Bitternut, white walnut	<i>Juglans cinerea</i>	0.4086	25.50	2,125
Black walnut	<i>Juglans nigra</i>	0.6115	38.17	3,181
Pecan	<i>Hicoria pecan</i>	0.7180	44.82	3,735
Shelbark hickory	<i>Hicoria ovata</i>	0.8372	52.26	4,355
Big shelbark	<i>Hicoria laciniosa</i>	0.8108	50.61	4,217
Black hickory—southern	<i>Hicoria alba</i>	0.8218	51.20	4,273
Pignut	<i>Hicoria glabra</i>	0.8217	51.29	4,274
White oak	<i>Quercus alba</i>	0.7470	46.43	3,886
Post oak	<i>Quercus minor</i>	0.8367	52.23	4,352
Bur oak	<i>Quercus macrocarpa</i>	0.7453	46.52	3,877
Overcup oak	<i>Quercus lyrata</i>	0.7213	51.80	4,316
Chestnut oak	<i>Quercus prinus</i>	0.7439	46.51	3,901
Live oak	<i>Quercus virginiana</i>	0.9501	59.31	4,942
Red or black oak	<i>Quercus rubra</i>	0.9540	40.60	3,363
Jack oak, or black jack	<i>Quercus marilandica</i>	0.7324	45.72	3,810
Spanish oak	<i>Quercus digitata</i>	0.6928	43.24	3,604
Pin oak	<i>Quercus palustris</i>	0.6938	43.31	3,609
Chinquapin	<i>Castanea pumila</i>	0.5887	36.76	3,062
Chestnut	<i>Castanea dentata</i>	0.4504	28.11	2,343
Beech	<i>Fagus atropurpurea</i>	0.6883	42.96	3,580
Hop hornbeam or Ironwood	<i>Ostrya virginiana</i>	0.8284	51.71	4,309
Hornbeam	<i>Carpinus caroliniana</i>	0.7286	45.48	3,707
White birch	<i>Betula populifolia</i>	0.7286	45.48	3,707
Paper birch	<i>Betula papyrifera</i>	0.5780	35.62	2,968
Yellow birch	<i>Betula lutea</i>	0.5955	37.17	3,098
Cherry or black birch	<i>Betula lenta</i>	0.6553	40.90	3,409
		0.7617	47.55	3,962

Balm of Gilead.....	<i>Populus balsamifera</i>	0.3635	22.69	1.890
White cedar or arbutus.....	<i>Thuja occidentalis</i>	0.3164	19.75	1.646
Red cedar (Pacific coast).....	<i>Thuja plicata</i>	0.3796	23.69	1.974
Yellow cypress (Pacific coast).....	<i>Chamaecyparis nootkatensis</i>	0.4782	29.85	2.489
Port Orford cedar.....	<i>Chamaecyparis laussoniana</i>	0.4621	28.84	2.493
Red or pencil cedar.....	<i>Juniperus barbadensis</i>	0.4926	30.75	2.562
Red cypress.....	<i>Taxodium distichum</i>	0.4543	28.36	2.363
Big tree.....	<i>Sequoia washingtoniana</i> , or <i>S. Wel-</i> <i>lingtonia</i>	0.2882	17.99	1.491
Redwood.....	<i>Sequoia sempervirens</i>	0.4208	26.27	2.189
White pine.....	<i>Pinus strobus</i>	0.3854	24.06	2.005
White pine (Idaho).....	<i>Pinus monticola</i>	0.3908	24.59	2.049
Sugar pine (Pacific coast).....	<i>Pinus lambertiana</i>	0.3684	30.90	1.916
Red or Norway pine.....	<i>Pinus resinosa</i>	0.4854	30.30	2.555
Yellow pine (California).....	<i>Pinus ponderosa</i>	0.4715	29.43	2.432
Loblolly or oldfield pine.....	<i>Pinus taeda</i>	0.4441	34.16	2.827
Longleaf or Georgia pine.....	<i>Pinus palustris</i>	0.6989	43.70	3.641
Black spruce.....	<i>Picea mariana</i>	0.4584	28.61	2.384
White spruce.....	<i>Picea canadensis</i>	0.4051	26.29	2.107
Tideland spruce (Washington).....	<i>Picea canadensis</i>	0.4287	26.76	2.280
Hemlock.....	<i>Tsuga canadensis</i>	0.4239	26.46	2.295
Hemlock (Pacific coast).....	<i>Tsuga heterophylla</i>	0.5182	32.85	2.529
Douglas fir or Oregon pine.....	<i>Pseudotsuga taxifolia</i>	0.5157	32.19	2.516
Noble fir or larch.....	<i>Abies nobilis</i>	0.4561	28.47	2.372
Tamarack or larch.....	<i>Larix americana</i>	0.6236	38.92	3.244
Western tamarack or larch.....	<i>Larix occidentalis</i>	0.7407	46.16	3.847
Wild black cherry.....	<i>Prunus serotina</i>	0.5622	36.34	3.028
Cottonwood.....	<i>Populus deltoides</i>	0.3889	24.29	2.023
Shortleaf yellow pine.....	<i>Pinus echinata</i>	0.6104	38.10	3.175
Swamp or Cuban pine.....	<i>Pinus cubensis</i>	0.7504	46.84	3.903

PART IV.—LOGS AND LOGGING.

LOGS.

Dead Head and Stray Logs.

Will you please state the difference between deadhead logs and stray logs?

The deadhead log is one which by the absorption of water or because of specific gravity sinks to the bottom of the river or it may be one end rests on the bottom and the other projects or rises above or to the top. Stray logs are those which are left along the banks by a sudden fall in the water or which become lodged upon sandbars or islands in the middle of the stream.

“Merchantable” Defined.

A contracts with B to buy all his poplar logs that are merchantable. Will you kindly state what kind of logs should be termed merchantable?

“Merchantable” is a term that in some markets and applicable to some kinds of lumber has been raised to the dignity of a grade. Unless this term was used to specify a certain quality of logs and the specifications for this quality were known and understood by both parties to the contract A is under obligation to receive and pay for all logs tendered from which could be manufactured lumber of value.

Merchantable denotes a quality inferior to the best but sufficiently good for ordinary purposes. In a number of districts poplar logs are divided into four grades

—first, second, third and culls—but nowhere has a merchantable grade of poplar logs been established. Merchantable timber or timber of merchantable size is a term often used to denote trees from which lumber can be manufactured and this acceptance of the term with respect to timber in this country is general.

Settlement on Mill Cut Basis.

A lets B a job of putting in logs at \$2.50 a thousand, lumber scale only (nothing being said about mill run). The contract with the mill man, C, called for \$2.75 a thousand, dead culls out. The scale C was to get B also was to get, but B claims he is entitled to pay for dead culls which are perfectly worthless as lumber scale being mostly from old, dead hemlock and an actual damage to A on account of the expense of handling them. Would it not be a difficult if not an impossible thing to expect a reliable scale from a person running an edger and keeping tally without a rule—just scaling by guessing at the length and taking the breadth from the edger and marking down each hundred feet as he added it up mentally? Would such a scale hold legally?

If a man running an edger can keep an accurate score in the manner described he certainly deserves a better position. It is very doubtful if it would be possible. “Dead culls,” as the term appears to be used in this case, applies to the product of dead and down timber, and the best of the lumber cut from such timber is of poor quality. The culls would be of no value. In northern Minnesota the loggers are required to put in the dead and down timber, but the camps do not receive any credit for this quality of logs. Although the camps are owned in most cases by the companies cutting the logs into lumber the practice might serve as a guide and may be sufficiently general to constitute a custom. It is unreasonable that anyone should receive pay for refuse from the logs and these “mill culls”

appear to be little less. Furthermore, if C, the mill man, is satisfied with pay for the mill product, less dead culls, then B also must be satisfied with the terms of settlement, as that is part of his contract.

To Determine Merchantable Logs.

Is there any mathematical rule for determining what is a merchantable log, that is to say, for calculating the defects in the log before it is sawed and ascertaining whether or not they are so serious as to prevent its being classed as merchantable?

There is no such rule. The broad definition of "merchantable," as applied to logs, covers a log which, after deducting cost, transportation and manufacturing charges, will leave a profit to the millman. The inspector does not pass upon the different grades the log will produce; he merely figures on his tally sheet the amount of lumber which may be sawed from the log, allowing for defects in accordance with his best judgment. Probably no two scalers would absolutely agree upon any selected log, but the results of a day's work would be approximately the same.

Size of Mount Shasta Logs.

In describing logging operations in the Mount Shasta district of California you said the average size of fir and sugar pine logs was about 750 feet. Will you kindly state to what length the logs are cut in the woods—to the length in which they will go through the mill or are they hauled in double length?

The majority of the logs cut at the plant in question are 16 feet long. Occasionally 18 and 20-foot logs are used. The basis on which the estimation was figured, however, was for 16-foot stock. The fir to which reference was made is known as red fir and grows to much

larger size than the white fir of the same district. The figures given were supplied by the superintendent of logging operation, and from the size of the trunks brought to the mills at McCloud the average stated is thought to be about right.

The timber at this place is handled mostly by big wheels from the woods to the skidway and all are cut to the desired length where the tree falls in order that they can be so handled to advantage.

Largest Walnut Log on Record.

What was the size of the largest walnut log of which you have any record?

As is the case with other large things, the largest walnut log is several in number. New York received, in 1885, a walnut log 9 feet in diameter and 12 feet long. It weighed 22,000 pounds.

Overrun Mill Cut Versus Log Scale.

What over-run may be expected on North Carolina shortleaf pine logs measured by the Doyle rule and cut with a band saw?

It is doubtful if the records of any two mills using the same rule would show the same percentage of gain. The Doyle rule was intended to show the number of square edge 1-inch boards which could be cut from a log of stated diameter and length cut with a circular saw, which cuts a wider kerf than the band saw. A large part of the sawed lumber product is 2 inches or over in thickness and the kerf of the old circular saw being $\frac{1}{4}$ to $\frac{3}{8}$ inches made it possible to secure several extra boards when the bulk of the log was cut into lumber 2 inches and over in thickness. Records of mill cuts in the southwest working in longleaf and shortleaf

pine show gains of 12 to 28 percent, the larger increase being at the mills turning out principally timber and heavy dimension. It will be safe for a mill employing a band saw and practicing ordinary economy in manufacture to figure on a gain of 20 percent in addition to a considerable quantity of lath and short boards which might be secured from slabs and edgings.

Size of White Pine Logs.

Has the size of white pine logs decreased since the white pine industry was at its height?

The following figures taken from the annual reports of the surveyor's journal of the second district of Minnesota from 1888 to 1902 give a fair idea of the decrease in the size of the white pine timber of the north. The figures quoted are the average number of logs required to make a thousand feet of log scale:

1888.....	7.6	| 1899.....	10.8
1890.....	9	| 1900.....	11.2
1897.....	10.6	| 1901.....	13.5
1898.....	10.8	| 1902.....	13.5

A Key Log.

What is a "key log?"

It is to a log jam what the keystone is to an arch—the piece holding the whole structure in place. It sometimes is difficult to locate and its removal is attended with the greatest hazard to life and limb. Frequently when one is removed, another or others take its place, rendering the breaking up of the jam a slow, dangerous and costly undertaking. During the formative period of the jam it may be possible for one of the drivers to dislodge the key log without great

trouble of danger, but after the jam has settled it has many times been found necessary to use dynamite to open the river.

Highest Price of Mahogany Log.

What was the highest price ever paid for a mahogany log?

This is a question which is impossible to answer absolutely, as transactions may have occurred of which there is no record. But so far as known, the highest priced log of mahogany was one purchased by John Hawkes, acting for C. H. Burton & Co., American operators in mahogany veneers. The purchase was made of W. W. Howard Bros. & Co., of London, England. The log contained 160 cubic feet or 1,920 feet board measure and the purchase price was \$3.71 a foot board measure, or \$7,123.20 for the log. It was cut from a Cuban tree and is said to have been almost perfect in figure.

Basis of Log Prices.

How are logs bought and sold?

The common practice is to buy and sell logs on the basis of their contents on a sliding scale of values; that is to say, the larger the log the more it is worth a thousand feet. Increasing the price with the increase of the size of the log is due to two things: First, it is possible to cut larger sizes of lumber from the larger log, and the larger sizes of lumber are harder to supply and bring better prices. Second, as the size of the log increases the percentage which the sap bears to the total log contents decreases. Thus in an ordinary yellow pine log twenty inches in diameter the sap would represent 27.75 percent of the whole,

whereas in a 13-inch log the sap would represent 40.83 percent, while the allowance would be the same in each case.

LOGGING.

Care of Frozen Hands.

What is the most simple remedy for frozen hands or feet?

Fill a pail with common wheat bran and throw in a couple of handfuls of salt. Mix with warm water in sufficient quantity to make a sort of bran mash, about as hot as a well hand can stand it. Into this insert the frozen member. This treatment will entirely withdraw the frost without serious injury.

Logging Dray.

What is a "logging dray" and what are its uses?

Logging drays were makeshifts employed by the pioneer lumbermen. They rarely if ever are employed now. The dray consisted of two small hardwood logs shaped with an axe to act as runners and fastened together with a bunk on which the log rested. The chain, used to hold the log on the sled, was wrapped around the log and bunk, then through the nose piece in the front of the dray and fastened to the ox yoke. This scheme operated to hold the log in place and applied the ox power direct to the load at the same time.

Splash Dams.

What is a splash dam?

The splash dam system is one of the earliest known methods of driving timber from the woods to the saw mill. In the northern country, where the flow of

water is comparatively steady throughout the year, they have been operated very successfully, but in the south, where the "tides" occur sometimes as infrequently as once in two years, their use has not been generally successful. Some of the largest southern splash dams are in Tennessee, where there are a number that are forty feet high, 400 feet across the top and eighty feet base, into the construction of each of which it was necessary to put almost 1,000,000 feet of timber and lumber. These dams were erected from twenty-five to thirty-five miles from the mill. They contain openings twenty-five or thirty feet in width for the passage of water and logs, and from these the splash boards may be removed in less than a minute. So great is the force of water in these mountain streams that it is said a locomotive placed in front of a dam would be driven a full mile by the rush of water when the splash boards are removed. Where the dams are successfully operated one splash a week carries sufficient logs to operate the mill for that length of time, as many as 4,000 logs having been sent down on one splash.

Economical Log Hauling.

What is the most economical method of hauling logs where operations are small?

Where the business will not justify the building of steel tramroads it is possible to put in a very economical wooden rail which will answer the purpose. A set of solid wooden wheels 24 to 30 inches in diameter, with 5-inch steel tires and an iron flange bolted on the inside of the wheel in such manner that it may be taken off, can be obtained for a comparatively small price and upon this a tramcar of any desired capacity

may be built. Pick out of the cull stock 2x10 for rails and on this may be nailed 2x4's, flat side down, breaking joints on bottom pieces. The wheels are so put on the axles as to allow for a 2½-inch play on each, which will take care of a 5-inch variation in the width between the rails, so that absolute accuracy in laying the track is not essential, although it is, of course, desirable. The first cost of this tramroad is very little and its subsequent maintenance practically nothing. This style of tram not infrequently is used in hardwood logging operations in the south.

First Michigan Logging Road.

When was the first Michigan logging road built?

It is claimed that the first logging road in Michigan was built in 1856 by the Glendon Lumber Company. It was in Glendon township and was eight miles long. It was a steam road and was first operated over wooden rails, but later rails which had been used by the Michigan Southern railroad replaced the wooden ones. The road was operated until 1870.

Camp Fare—Past and Present.

How did the camp fare of the old days compare with that of the present?

In the early days in Michigan it was not unusual for a crew to leave for the woods equipped and provisioned for its winter work. Lack of finances and difficulties of transportation limited the supplies to the necessities. The provisions consisted largely of salt pork, beans, molasses, vinegar, pepper, salt and flour. Fresh beef was unknown, but occasionally one of the loggers killed a deer or bear and added variety to the monotonous fare. Potatoes were served once or

twice a week more in the nature of tonic or medicine than a food. In those days pies and puddings were strangers as were all cereals. In many cases the "boss" was cook and cookee, particularly in the smaller camps.

Now all has been changed. The cook is one of the important functionaries and guards with a jealous eye his domain, the kitchen. The commissary in the average northern pine or hardwood camp now includes such delicacies as short-rib pork, bacon, hams (largely shoulders), cereals, rice, raisins, prunes, pickles (usually several varieties), cheese, canned fruits and vegetables, coffee, tea and a list of articles for seasoning equal to that employed by a chef in a first class hotel. The old time loggers claim the new crews are inefficient and lay the blame to the food, but none of the "old guard" has made a very vigorous protest to have the bill of fare limited to the old menu.

Do Warm Axes Cut Better Than Cold?

Some old-time loggers, it is said, would build a fire to warm their axes when they would not think of doing so for their own comfort. Is this a fact?

Axemen, it is claimed, believed that a cold bit would not cut as well as a warm one and for this reason built fires to warm their implements. The efficacy of the remedy is not known.

Record Day's Output.

Can you furnish the record of some big day's work in the woods?

Among the early Michigan records are the cuts of 213 and 231 logs by rival claimants among the fellers. Later, these records were surpassed by cuts of 281

and 333 logs. All of the foregoing was the work of two sawyers in 1882—days when big logs only were handled. In skidding, two teams and two men, the totals are 1,015, 1,362 and 1,181.

Ocean Log Rafting.

Has the rafting of logs over long distances ever been successfully accomplished on the Pacific ocean?

The illustration shows a log raft which was towed 1,150 miles from Astoria to San Diego, arriving at its destination September 10, 1906. This voyage broke all records for both time and distance, the raft having made the voyage in fourteen days. It was of⁴cigar shape, 600 feet long and forty-four feet wide and contained about 4,000,000 feet of logs, some of which were six feet in diameter and 100 feet long. Nearly 110 tons of 2-inch stud-link chain were used besides a long chain running the entire length in the center like a backbone. The core of the raft contained cut lumber intended for use in the construction of a mill at San Diego by the Benson Lumber Company, to whom the raft was consigned.

Logging Mahogany.

Is mahogany difficult to log?

Mahogany probably is the most difficult and expensive wood to get out that has yet come into use. Forests in which mahogany grows are filled with a tangle of vines and underbrush which necessitates a road to each individual tree. A mahogany tree grows large spur roots and it is necessary before it can be cut down to build a stage ten or fifteen feet high around it in order to cut through the trunk. When



OCEAN GOING LOG RAFTS ENTERING PORT AT SAN DIEGO, CAL.

this has been accomplished the log is hauled to the stream by ox teams, it sometimes requiring fifteen to twenty yokes to get the heavy timber out through the brush. Of late years some attempt has been made to log mahogany by tramroads and the work is successfully done in Nicaragua by the George D. Emery Company, of Boston, Mass., but as a rule the old methods are still adhered to, the logs being squared as they were at the beginning of the industry, much valuable material thereby being lost.

Logging Regulations on Sabine River, Texas.

What regulations govern logging on the Sabine river in Texas?

1. Steamboats have the right to navigate the river at all times.
 2. Loose timber and logs and sack raff (so called) of timber and logs may be run at all times, provided the operations are conducted in such manner as not to form dams and blockades or otherwise unreasonably interfere with the other classes of navigation.
-

First Steam Logging.

When was logging first done by steam in Pennsylvania?

In the spring of 1864 Wright & Pier, at Callen Run, on the Clarion river, Pennsylvania, purchased a small portable boiler and an engine of about 8-horsepower and placed them on a little wooden car. The engine ran over a tramroad four miles in length which was built of cribbing and stringers, having wooden rails. Alfred Truman, then a boy of 18, was engineer, fireman, brakeman and also loader—in fact, he was the whole operating force of the tramroad.

The Record Load of Logs.

What is the biggest carload of logs on record?

The Escanaba & Lake Superior Company, of Wells, Mich., claims to have loaded 9,500 feet of white pine logs weighing 62,000 pounds, and several times have loaded 5,000 feet of maple and birch logs weighing 71,000 pounds.

How Pole Roads Are Built.

What is the best way of building a pole road?

Pole roads for logging purposes are the simplest among the many forms of road which lumbermen find convenient and necessary when snow and ice roads are not available. They can be constructed in any locality where the ground is reasonably level, and are particularly adapted to such locations as present a sandy or fairly firm soil. They consist of long, small peeled poles, the longer the better, from 4 to 5 inches in diameter at the top, to 8 or 10 inches at the butt end. The more evenly they carry their size from butt to top, the better the road. The ends of the butts, as well as the tops, are long scarfed, and pinned together with suitable hardwood or other strong pins of 1½ or 2 inches in diameter according to size of timber through which they are to be driven. Tops should be scarfed to tops, and butts to butts, in order to provide a perfect bedding for all parts in the ground. If the scarfing is done so as to cause the poles to lay naturally on the ground when in place, the pins should be long enough to penetrate the earth for some distance. This is all the fastening or anchoring usually provided. The wheels of the car are concave, or V-shaped, and as they pass over the rails naturally force them to maintain their proper distance from

each other, while preventing their spreading apart. It will take but a few trips of a loaded car over these poles to bed them in the earth, when spreading is practically out of the question. The wheels must, in their concave surface, be adapted to the general size of the poles to be used, and if larger poles are employed or larger butts are used, an ax must be used in hewing off enough of the surplus wood to give the wheels a sure bearing. Any kind of timber which carries its size well may be employed, and if a pole gives out it is easily replaced. But comparatively little grading is required, although it is obvious that the more level the top of the track is kept the less friction is encountered. For this reason it is well to bed the butts enough to bring them level with the bedded tops. No crosstieing is employed, and so solid are these roads that in many sections light locomotives are run upon them. With these general points stated any man who comprehends the conditions under which concave wheels may be kept from running off through mounting the poles should have no difficulty in building a pole road. If the soil is not sufficiently firm to prevent the poles from becoming too deeply imbedded, crossties of poles may be used, but as a rule they work more harm than advantage, as they tend to prevent the self-adjustment of the track for which the concave wheels would naturally provide.

Plan for Pole Road Cars.

What is a good working plan for building pole road cars?

A good car may be made 10 feet long by 6 wide, consisting of four sills, two on each side, about 4x8, and two cross sills 4x12, framed and bolted together. They are mounted upon four cast wheels 36 inches in

diameter, 12-inch face, concaved to a depth of 6 inches or less, placed between the side sills, which should be 20 inches apart. Each wheel has a separate axle 36 inches long, working in axle boxes of 4-inch bearing, thus giving 8 inches lateral play, allowing the wheels to accommodate themselves to the crooks in the poles. The tongue works loosely through mortices in the front, and hind cross sills or bolsters being a simple taper pole, flexible at the front end and attached to the hind sill by stay chains. Under the side sills, in front of the hind wheels, brake-blocks are suspended by long links, swinging loosely on bolts through side sills. These blocks are fastened to a bar which reaches from block to block, under the tongue, and pivoted to it by a strong bolt, furnishing an automatic brake, reliable, durable and always in good order, applied by the horses or mules holding back on the down grade.

This car needs no king bolt or rocking bolster and will keep the track safely and carry 2,500 feet of logs, 16 feet long, on an easy grade, for two spans of horses or mules, or two yokes of steers. The cost of irons need not be more than \$80. If the road is to be much curved more gage is better. If you use more than one span and for long and varying lengths a car of six wheels is better, the last pair being adjustable by stretcher poles through the bolsters of the front car.

Boom Construction in West Virginia.

Please give an account of boom construction in the rough streams of West Virginia.

The following is a description of the method employed by one of the leading companies operating in West Virginia:

We have been operating booms of this nature in West



LOG BOOM CONSTRUCTION ON CENTRAL EASTERN STREAMS.

Virginia ever since 1873. Our streams are so rough in this section of West Virginia that we have to build a very secure boom. Our method of construction is to build a series of piers diagonally across the river, the angle depending on the swiftness of the current at the different points. These piers are constructed of white oak timbers 16 to 18 inches in diameter, hewn to 12-inch face. They are about 20x40 feet at the base, tapering to twenty feet square at the top, about thirty feet high. These piers are filled with broken stone. To the outside of these piers in a continuous string we hang heavy boom timbers, poplar, each fifty to seventy feet long, fitted with yokes on the ends, connected with 2-inch iron rings about twelve inches in diameter. This string of boom sticks or floaters is connected to a point about midway up the piers by 1 ¼-inch iron chains. These booms are so constructed that when the logs are in the weight of the log jamb rests largely on the piers, not on the boom sticks.

Overhead Cable System.

In a recent issue of the *LUMBERMAN* you illustrated a wire cable method for getting in shingle bolts, used in California, and it occurs to me that such a scheme could be put to good use in these mountains. I would appreciate it very much if you will tell me where I could get detailed information about this plan, or who makes the apparatus, and the cost of it etc. Awaiting your reply with great interest, I remain, very truly.

The article to which correspondent refers appeared in *The Editor's Pilgrimage to the Far West* and was descriptive of the cable method employed by the shingle manufacturers in Humboldt county, California, in getting bolts to the shingle mill.

The overhead cable system is used to a considerable extent in various parts of the country where the ground is rough and badly broken. In some parts an additional cable is strung and the logs caught up and moved over ravines by means of movable cables. In the instance cited above, however, the cable itself moved on a per-

fected system where the shingle bolts were caught up and released while the cable was in motion. It might not be possible to do this should the principle be applied in bringing logs to the mill on account of the great weight of the logs. The cost of an arrangement of this kind, providing the idea is not covered by patent, would depend very largely on the length of the cable and the weight and size of the timber to be carried, which, of course, would have to do with the strength of the cable.

Logging Appliances.

I am getting out a large lot of ties at Tinguindin, Michoacan, Mexico, with Bain log wagons, but the road material is very bad, and as we have a six months' rainy season we have eight months of mud and the rest dust. I have a fifteen mile haul. Seven miles from the railroad on the road is a spring giving 300 gallons a second. All down hill and 3 to 6 percent grade.

I desire to learn if a V-shaped flume, each side 16 inches high, will carry standard oak ties, practically. I made a 300 feet length and on 4 percent grade it worked well. From this spring to the timber is all up hill, averaging about 10 percent.

I desire to learn about how many ties I can drag with a yoke of oxen in a log slide or "chute" on this grade. I intend to keep it lubricated with crude petroleum.

Transporting oak ties by flume from the spring to the railroad with a V-shaped flume with 16-inch walls should prove practicable. The water supply should be ample and although the grade is light it should suffice to carry the ties. A practical test would be about the only practical way of finding out how many ties a yolk of oxen could drag along a prepared chute of the character outlined. The practicability of the transportation means which it is desired to install would depend in large measure upon the number of ties to be secured. A great deal of expense is connected with putting in

facilities of this character, and unless there are large amounts of timber tributary to the slide it would not prove a profitable venture. Log slides and flumes have been used to a greater extent in the west than in any other district.

Felling Timber in the South.

How are trees cut in the south?

It is now a universal custom to use a crosscut saw in felling trees. Until a few years ago it was customary to leave stumps from 2 to 4 feet in height, because it was easier for sawyers to work that distance from the ground. Now the rule is enforced by almost all of the saw mill operators that the height of the stump shall not exceed the diameter of the tree and that 20 inches shall be the greatest height allowed for stumps. When a tree has been felled, it is cut up into log lengths which vary according to conditions, but the general rule is that the first or butt log shall be 16 feet long.

One Method of Raising Deadhead Logs.

What success has been met with in hauling out deadhead logs; how is it done and how many can be lifted in the season? How much does it cost a thousand feet and are any pine deadhead logs found?

The work of reclaiming deadhead logs has been carried on to a greater or less extent since 1893. A large scow is fitted with a steam derrick and an engine which furnishes power for a drum. On this drum a steel cable is wound. The cable passes over the derrick and through a sheave. At the end of the cable is a pair of tongs which are used to grapple the log. When raised clear of the water the log is swung over onto the bank and dropped on skids. The number of logs which can be

lifted in a season would depend entirely upon the force employed and the number and character of the sunken logs, and this latter consideration would be an important factor in the cost of the work figured upon a basis of a thousand feet. So far the work of reclaiming these deadhead logs has been practically confined to Michigan and Wisconsin, and as in these two states the greater percentage of the timber floated in the days of their great lumber operations was pine, it naturally follows that most of the logs which have been taken from the beds of the Menominee and other rivers are pine logs. As most of the deadheads became such through their having become waterlogged, the heavier woods sunk in greater proportion than did the pine, but so much more pine went down the streams the other species are relatively unimportant.

Profit in Deadhead Logs.

Of late years the press of the country has given a great deal of attention to schemes for raising deadhead logs. Will you kindly state whether or not this is a profitable business?

Among the first records of work of this kind was the reported raising of 75,000 deadhead logs on the upper waters of the Muskegon river, which were brought to the mills and manufactured. There has been and is a great deal of difference of opinion in regard to whether or not this business is a profitable one. Some well informed lumbermen claim that sunken logs are made up entirely of the inferior quality, such as hollow butt white pine, the cavities of which become filled with sand and forced the logs to the bottom, and small heavy norway log, whose specific gravity is nearly as great as that of water. Recently it was stated recovered deadhead logs would not average more than fifty feet to the logs and

the lumber cut from such timber was of inferior quality, No. 3 and poorer. During 1905 and 1906 a number of companies were organized, the purpose of which was to raise the deadheads on some of the old logging streams in the northern pine states, particularly in Michigan and Wisconsin. Some of these companies were mere tentative projects, and never took up the work on the scale originally contemplated. Logs totally immersed in water will last for centuries. The bottoms of many of the northern logging streams are covered with logs of some description, and it is only reasonable to suppose that a fair percentage of this timber is of good quality.

Pay for Log Driving.

Two other logging concerns placed their logs in the river with ours and because of their neglect to do their part of the work we were forced to drive their logs with our own—this taking place in Minnesota. Are we entitled to compensation for our work?

Matters of this kind are governed by the statutes of individual states. The statutes of 1894 of Minnesota state that the driver of logs has an equity in the logs when he is compelled to drive them through the negligence of the owners, this equity being equivalent to a reasonable compensation for the work performed. Where the matter is not governed by statute recovery probably could be had under the common law.

Wages of Loggers in British Columbia.

Can you give us any information concerning the scale of wages paid in lumber and shingle mills and log camps in the vicinity of Vancouver, British Columbia?

In 1903, L. Edwin Dudley, United States consul at Vancouver, reported the scale of wages as follows:

LUMBER MILLS.—Laborers—White, \$1.75 to \$2 a day. Japanese. \$1 to \$1.60, Chinese 90 cents to \$1.30; head sawyer, \$4 to \$5; carriage riders (white), \$2.75; edgermen, \$2 to \$2.50; edgermen's helpers, \$1.75; trimmers, \$2 to \$2.50; engineers—first class \$80 to \$125 a month, second class \$60 to \$75; firemen, \$45 to \$60.

SHINGLE MILLS.—Sawyers, from 11 to 15 cents a thousand feet; packers (Chinamen), half the amount paid to sawyers; laborers, \$1.75 to \$2 a day; engineers, second class, \$60 to \$75 a month; firemen, \$45 to \$50 a month; Chinamen, 90 cents to \$1.35 a day.

CAMPS.—Men are paid only for actual work. If rain or other cause shall prevent work men receive no pay. Fellers, \$3.50 to \$4 a day; butters, \$2.50 to \$3.50; snipers, \$2.50 to \$3; barkers, \$2.50 to \$3; skid roadmen, \$2 to \$2.50; hook tenders, \$2.50; engineers, second class, \$60 to \$75 a month; firemen, \$45 to \$60 a month.

All men pay their board out of these wages, the cost of which varies. Wages in 1906 were slightly higher.

Felling Fir in the Far Northwest.

Will you kindly explain how they cut down large fir trees in Washington and British Columbia? We have had a discussion and would like you to settle it.

The illustration given herewith shows two sawyers at work in the fir forest of Washington, and a fairly good idea can be gleaned therefrom as to the manner of procedure.

The first step is to clear away the underbrush, then cut notches in which the foot boards are inserted. The notch cut is not very deep for the board is shod with a steel point so that the weight of the sawyer causes it to bite into the tree at every movement of the man on it.

When this has been arranged the undercut is made, as will be seen in the engraving. The direction in which the tree will fall is determined by the manner in which the undercut is made and the experienced logger can

tell to a nicety just how to make the cut in order to throw the tree in any given direction. These preparations usually are made by a separate crew, the sawyers being employed solely to sever the trunks.

The sawyers begin work on the side opposite to that containing the undercut and work toward it. If it is



FELLING BIG TREES IN THE PACIFIC NORTHWEST.

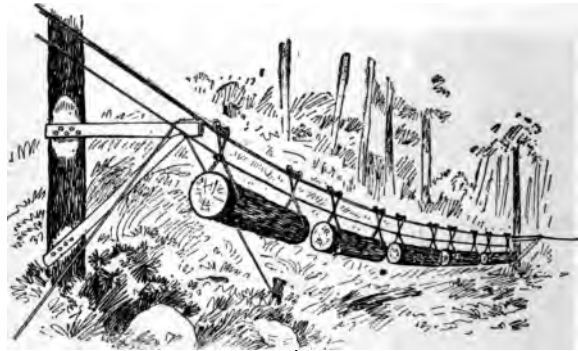
desired to change the direction in which the tree is to fall one end of the saw is allowed to cut faster than the other and the restraint exerted by the uncut portion of the trunk causes the tree to veer from the direction originally intended by the undercutters.

The same practice holds good with practically all of the big trees of the coast and the above description fits the general method employed.

Logging Device for Mountainous Country.

In a mountainous country where logging by railroad is impossible and sliding logs impractical, how may logs be conveyed to the mill?

Under conditions similar to these, logging operations have been conducted by means of a trolley as



AERIAL LOGGING DEVICE—EASTERN TENNESSEE.

shown in the accompanying illustration, which is itself explanatory.

Log Booming on the Brazos River.

What is the best method of rafting logs and fastening them together? 2. What is the best way to stop logs with the greatest safety? 3. What is the best and most economical way to build a boom across a river like the Brazos?

At this point the stream is over 300 feet wide and has from 15 inches to 25 feet depth of water. The rises are often and come fast. Our aim is to arrange some way to stop or catch the logs without tying them together. Any information you can give will help us greatly and will be highly appreciated.

Pine logs, or "floaters," as they are called, in distinction from hardwood logs that will not float, are

fastened together by dogs fastened in the outer logs of the brail and connected by ropes. Hardwood logs, that require floaters to support them in the water, are usually held together by binding poles laid across the top of several logs placed abreast, with what are called chain dogs to hold the binders in place. The chain dogs consist of a short chain with a spike attached to the ends. These spikes are driven into the log each side the binding pole, and driven into the log so that the chain shall strain down tightly on the pole. Logs thus brailed together can be collected into a raft or run down stream singly. In the north logs are dumped into the stream promiscuously and run down on the current when the water is high enough; that is, if the logs are pine or cedar. If we knew what kind of logs it was desired to float the question about rafting could be answered more specifically.

In answer to the second question, What is the best way to stop logs? and the third, What is the most economical way to build a boom across a river? one answer will suffice for both. Where the rises come often, quickly and high the better way would be to catch and store the logs in side booms. Select a bend of the river where there is a bay or bayou at one side in which there is still water and construct a sheer boom or pier, wing dam or other device by which to direct the logs into the still water bay, bayou or reservoir where the logs are to be held. This method ordinarily will hold the logs safely while the main current is raging outside. In ordinary stages of water the logs can be floated out and run down to the mill. Of course it would be better to have the reservoir near the mill, but such holding ground can be located anywhere on the stream above the mill and the logs let out when conditions are favorable. In no case should an attempt be made to catch

and hold logs in a river like the Brazos by extending booms across it. The result would surely be disastrous and cause much loss. It is also probable that the correspondent will find that the safest way is to hold the logs in brails and float them down thus secured to the side boom or holding ground. To answer adequately one would have to look over the situation personally, and decide on the best method for that particular locality and by the conditions pertaining to that particular stream.

Importance of Loggers of the Pacific.

Are independent loggers of any great importance in the manufacture of lumber on the Pacific coast?

Logging operators in Washington and Oregon play no inconsiderable part in lumber affairs. At the larger points of lumber manufacture, notably on Puget sound, Grays harbor and the Columbia river district, the mills are supplied with cutting stock almost entirely by companies which make a specialty of this end of the business. Concerns engaged in the work have found it to their advantage to organize associations, and where a majority have become identified with the organization it is possible to regulate matters so as to serve the best interests of all concerned.

The loggers have made it possible to engage in the lumber business at a minimum expense; that is, all it is necessary for the prospective manufacturer to do is to secure a mill site and provide sufficient capital to conduct operations until returns shall be received from the sale of the products. For this reason it is not unjust to charge the logger with contributory responsibility for the big increase in the output of lumber on the coast. His work takes a large part of the worry

and responsibility incident to lumbering operations from the shoulders of the lumberman, who, thus relieved, may devote his attention to the manufacture and sale of his products.

For a good many years to come the logger will continue to be a factor in western operations in the districts named, but it is perhaps safe to say that the zenith has been reached and that in the future his part in the production of lumber will slowly decline. This statement may be limited and possibly will be by the fact that timber holders will turn over to the experienced logger their holdings, transactions being based on the payment of so much for the work of cutting the timber and transporting it to the mills. At present the logger owns the timber which he supplies to the lumbermen and those concerns which hold considerable standing timber prefer to secure supplies from the loggers and reserve their own stumpage for future requirements.

Those concerns which have taken up the lumber business as a permanent occupation and not merely as recreation or to pass a pleasant time have, nearly all of them, large bodies of timber which will be used when the logger shall be unable to provide a supply of stock for cutting.

In any event the elimination of the logger as a factor in supplying timber to the mills, which will be accomplished as the years shall roll by, will give to the timber owning mills a distinct advantage and enable them to control the situation more fully. Taking a glimpse at the future it is not unreasonable to suppose that within the next ten or fifteen years the increased demand for Pacific coast lumber and the higher prices which will then be realized will have impressed the fact upon the minds of operators that in the end coast timber will

be used to fill a large part of the world's lumber requirements and doubtless will have seen the inauguration of practical forestry which shall insure a permanent supply.

Floating Hardwood Logs.

Would be thankful for a little information regarding the floating of maple and birch logs. As I understand the matter or, in other words, am told that if the tree is cut down in the early part of the summer and left on the ground untrimmed until near fall it will float successfully and without loss. I would thank you very much if you could give me any light on the subject.

It is not probable that maple and birch logs can be handled successfully in the manner outlined by the correspondent. They might be dried out enough by the method named to insure floating, but most varieties of Michigan hardwoods, notably maple and beech, very quickly sour, stain and dote, especially when cut in the early part of the summer. If this experiment were tried at all the timber should be felled during the winter, when the sap is down, but it is doubtful if the experiment is worth trying. Michigan hardwoods should be sawed as promptly as possible after the trees are felled to insure the best possible results.

Strangest Craft Used in Towing Logs.

What is the most unusual craft used to tow logs?

The plum is awarded to "McDougall's Nightmare," so called, which plied the waters of St. Croix lake, at Solon Springs, Wis. It is the creation of the inventive genius of Miller McDougall, son of Capt. Alexander McDougall, of Duluth, Minn., the inventor of the famous "whaleback" type of lake carriers, for so long a time termed "McDougall's Dream."

Captain McDougall erected a saw mill on St. Croix

lake with a capacity of 26,000 feet a day. As the mill neared completion the question came up of some means of transportation of the logs to the mill. The matter was finally left to Miller McDougall, and his friends claim that in his invention he has fully lived up to the prediction that he is "a chip of the old block." The



"McDOUGALL'S NIGHTMARE."

young man was given full scope and he was not long in devising the craft herewith shown, which is a never failing source of interest to the summer visitors at the lake resort.

The motive power of the strange craft consists of the old boiler and winch machinery from a dismantled mill. These were set up on a large scow which was caulked top and bottom until practically water tight. Shafting across the front end of the craft connects with large wooden paddle wheels on either side and, these revolving, the boat is "pulled" along at the rate

of about four miles an hour without a raft of logs. With logs in tow its progress across the lake is necessarily slow, but as fuel costs practically nothing and one consignment of logs will keep the mill in operation for some time speed is not a necessary adjunct of the boat. The rudder is a large door-like attachment at the end of a long pole projecting back into the water from a crotched stick on the rear of the scow.

Boot Packs.

What are "boot-packs"?

A covering for the foot much favored by the early northern loggers. It is somewhat similar to the Esquima boot, made of rawhide and of ample dimensions. These "foot houses" were filled loosely with hay and the foot, covered with several thicknesses of stocking, thrust into them. They were cumbersome but protected the feet from the frost.

Loggers' Slang.

Have loggers, or lumberjacks, used as many colloquialisms as reported?

Not knowing what have been reported it is not possible to say. Here is a sample lot once used:

Happy Harry Murphy, a top loader from a camp a few miles out of Duluth, Minn., was brought in to St. Mary's hospital, that city, the other day with a broken leg. After it was set one of the sisters at the institution asked him how it had happened.

"Well, you see, I was the skyman," said Harry, "and we were shy a grounder, and there was a gaza-boo come down the pike and the push took him on. The first thing he sent up was big blue butt, and I yelled out to him to throw a Saginaw into her, but he

St. Croixed her, and then he gunned her, and she came up and cracked my stem."

"I don't understand," said the sister, "what you——"

"I don't either," interrupted the top loader. "I think he must have been bughouse or jiggerood."

Season for Cutting Old Pine.

What is the best time to cut old, overgrown pine?

In the fall the tree sheds its punk after the coming of the cold rains and frost and this is said to be the most favorable season for cutting the trees.

Tree Felling Devices.

Has any practical mechanical means for felling trees been devised?

This is a subject which long has received attention from practical lumbermen, and although several machines have been constructed for use in particular regions no satisfactory adaptable tree felling device has been put on the market. The machines which have been built were not perfected to the point where they were usable under variable conditions.

Records in Log Hauling.

What is the record amount of timber placed on the roll-way with one engine?

The Oregon Timber & Lumber Company, of Clifton, Ore., records the loading in one day of 105 logs scaling 198,550 feet. The distance the logs were run ranged from 400 to 1,000 feet.

The Polson Bros. Logging Company, of Hoquiam, Wash., has a record of 106 logs scaling 200,000 feet

as one day's work, but in this case the logs were hauled to the loading platform by one engine and loaded by another.

Feeding Lumber Jacks.

I have become interested in a logging operation on this coast, and am somewhat unacquainted with the details of camp management. I desire information as to what is the common practice in eastern camps in respect to the food furnished to hands employed in the woods. Can you give me a list of edibles which constitute supplies for the table of the average camp in the woods operations of Michigan, Wisconsin and Minnesota? Any information you can give about board in logging camps will be gratefully received.

Within ten or fifteen years there has been a notable improvement in the camp fare furnished hands in the logging operations of the old pine states. Time was when salt pork, salt beef, beans, potatoes, bread, coffee and tea were considered a sufficiently elaborate menu for the camp. As years passed a change was gradually evolved in this particular. The increase of operations, the rising wealth of lumbermen, the competition between operators to secure sufficient crews, the clamor of the men for better board, combined gradually to improve the bill of fare at camp tables. The motives that actuate operators in general in making up their food supplies for the camps are well expressed by one of the leading operators in Michigan. He says: "We find it necessary to take good care of our employees in the woods, as we find in that way we secure the better class of help and less of the floating population. We find that it costs about \$3 a week for each man for supplies furnished the cook's shanty, and we cannot expect to get good results from our men unless we take good care of them. I am unable

to call to mind many articles we do not use, but you will see by the accompanying list that we do not use any mutton, chickens, turkeys or fresh tropical fruits. These we would consider a little too expensive. In taking meals at these camps I have noted with curiosity the fact that there are always several kinds of bread and cake on the table, and generally pie twice a day. I have not attempted to make a bill of fare, but one can judge as to what such a fare could be made by the skillful use of the articles in the following list:

MEATS.

Bacon,	Salt beef,	Eggs,
Smoked ham,	Salt pork,	Oysters on Christ-
Fresh beef,	Salt codfish,	mas.
Fresh pork,	Fresh fish,	

OTHER SUPPLIES.

Granulated sugar,	Beets,	Graham flour,
"C" sugar,	Cabbage,	Bolted meal,
New Orleans molasses,	Parsnips,	Rolled oats,
Baking powder,	'Bagas,	Rice,
Lard,	Green corn,	Crackers,
Coffee,	Evaporated apples,	Calumet brand of
Beans,	Dried peaches,	oleomargarine,
Canned tomatoes,	Dried prunes,	Extract of vanilla,
Canned corn,	Dried apricots,	Extract of lemon,
Canned lima beans,	Raisins,	Corn starch,
Canned string beans,	English currants,	Nutmeg and all
Canned peas,	Canned apples,	kinds of season-
Dried peas for soup,	Canned pumpkin,	ings,
Cheese,	Jelly,	Mince meat,
Pickles,	Flour for bread,	Catsup,
Potatoes,	Flour for pastry,	Onions.
	Buckwheat flour,	

This is a list of food goods elaborate enough with which to start a grocery and provision store. A lumber jack who would complain of a bill of fare made up of so many and such a variety of edibles would

kick at the menu of a first class hotel. The life of the camp hand is one that induces a keen and enormous appetite, and a digestion that would successfully tackle a bootleg steak. The task of feeding such a gastronomy with a toothsome list like the foregoing must be a herculean one. Our western correspondent may view the undertaking with alarm, but he should tackle it with the courage born of the knowledge that the eastern lumbermen have been thus feeding their men.

Girdling of Tupelo Gum.

In your opinion would the girdling of tupelo gum a year or two previous to felling be of advantage in handling the lumber product? Would not this system act as a preventive of checking and warping and would it not diminish liability to stain?

Dr. C. A. Schenck, forester of George W. Vanderbilt's Pisgah mountain forest reserve, is of the opinion that the girdling of the tupelo gum would be of value in the resultant lumber production. Dr. Schenck's suggestions on this subject are as follows:

"The plan to girdle tupelo gum timber in order to kill the sap and hence decrease the hygroscopicity has my full measure of approval. Under hygroscopicity we understand the relation of timber to water. The warping is due merely to a change of the watery contents of timber, due to the change of watery vapor in the atmosphere or due to the water absorbing power of lumber. It is well known that live sap increases hygroscopicity.

"The best means to reduce hygroscopicity to a minimum is the steaming of the logs or continued submersion of the logs in the running water. Deadening of trees, too, is without a doubt a splendid scheme.

It will be best, in my opinion, to deaden the trees in winter. The buds will then open and the leaves unfold, using up the majority of the sap of the tree.

“When the leaves begin to wither, then the time has come for cutting the tree into logs and lumber. An additional advantage of the girdling method is the increased floatability. My own experience in girdling tupelo gum (*Nyssa sylvatica*) tends to show that it is impossible to kill the tree in one season. The trees frequently remain alive for three or four years, the leaves getting continuously smaller until, after the lapse of time given, the tree actually dies. The death rate of the tupelo gum will be increased by very deep girdling.

“Results similar to those obtained by girdling might be secured by cutting the trees in early spring before the opening of the buds, without then dissecting the bole into logs. It will be found that the buds open and the leaves unfold again; when they begin to wither the sap is largely consumed and logs from trees thus treated are very apt to show similar qualities in the saw mill to those obtained from girdled stock.”

LOG SCALING.

Basis of Log Measurement.

What is the customary system of log measurement?

The original system by which logs were to be computed, as arranged by Doyle, contained only some recommendations of a general character as to the allowances to be made for crooked logs and other defects. The rules were little more than a table giving the contents of straight sound logs of varying size. In Scribner's

Lumber and Log Book, based on Doyle rules, the following recommendation is made: "Logs are seldom exactly round or perfectly straight, besides having many irregularities covered by the bark, hence allowances should be made to the purchaser." Just what allowances should be made is largely a question of judgment on the part of the scaler. It is customary to measure crooked logs on a basis of what they will square. If a log that ordinarily would make a piece of timber 12x12 is curved so that only an 8x12 can be produced the contents are set down at that figure. In other words, crooked logs are measured at the point where the saw will pass from one to the other and take off a slab, and in the ordinary operations of the American lumbermen no allowances are made for the slashings.

In regard to measuring long logs the customary practice is to measure all logs up to 24 feet in length at the small end. Longer timbers are measured in the center with calipers, and in case of logs of great length it sometimes is customary to measure at the end of each 12, 14 or 16-foot length and compute the entire contents in that manner.

No hard and fast rule can be given, but in general the foregoing is the basis on which calculations are made.

How to Scale Logs.

One point which causes more disputes than any other with scalers in the woods is that relative to what Scribner means. It is nearly accepted that the Scribner rule means a straight sound scale, based upon inch boards, but there ought to be some practical suggestions by Scribner as to how to apply the straight and sound scale.

Pine logs are a great deal like the human family—there are many imperfections in them—and how to reduce the log

to straight and sound scale is the important duty of the man in the woods. Have you any information on this point that we could use for our purpose with the scaler and in drawing up contracts?

In the Hand Book for Lumbermen published by one of the predecessors of the AMERICAN LUMBERMAN the following general observations of the methods of log scaling are given:

The first thing a log scaler determines is the length of the log, then its quality or grade, which must be determined by the defects visible to the eye. These consist of crooks, knots, punks, hollows etc. Looking at both ends of the log, he ascertains whether there is any hollow, or ring rot, and if the butt is free from shake. Having settled these points he lays his rule on the narrowest diameter of the small end of the log. If it is crooked he takes his diameter (always inside the bark) from a point which allows the saw to pass through the log, fully removing the slab. If the butt is hollow he adds three inches to the diameter of the hollow, multiplies the size by itself, and deducts from the gross measurement. If it is a shaky log he allows for that in determining the quality. If it has not been properly square-butted he makes a memorandum, so that the expense of butting can be charged to the seller, or logger, unless in the bargain he is instructed to deduct enough from the measurement to cover the cost. A log cannot be considered merchantable until it is fully prepared for market. If it is very knotty he lowers its grade accordingly, if he is grading in quality. If the knots are large, black or rotten he is to determine the class in which the log belongs by the damage caused by the defects. If the defect is ring rot he should take no account of the log at all, as it is not worth the expense of handling in the majority of cases. If a log is less than twenty-four feet long it should be measured at the end. Over that length it is usually measured in the middle by calipers. In very long timber it is sometimes customary to measure at lengths of twelve, fourteen or sixteen feet. This, however, is a matter of agreement between buyer and seller. Dead timber is always measured inside the decayed or black stained sap. In many hardwood sections the sap is always excluded from the diameter of the log. Bright sap in pine, hemlock, poplar, whitewood, basswood and spruce

is always measured. Diameters are always to be taken inside of the bark the smallest way of the smallest end of the log.

Owing to the closer utilization of the pine timber in the north scaling undoubtedly is on a closer basis now than when the recommendations given above were in general practice. We are forced to agree with our Michigan friend, F. G. Campbell, in the statement that each log must be scaled with a view of ascertaining beforehand the amount of lumber it will make and that the best way a basis for such measurement can be secured is by following the log through the mill and finding out what percentage of waste defects of an ordinary character will cause. There is and can be no hard and fast rule for scaling logs other than round, straight timber, which are measured on the basis of how much inch lumber they will cut.

Doyle Rule Defined.

We have a contract with a logger, specifying that logs "are to be measured by Doyle's rule." What is Doyle's rule?

The Doyle rule is a table showing the quantity of square edge inch boards that can be cut from all sizes of logs from 8 inches in diameter and 8 feet long to 60 inches in diameter and 40 feet long, with general rules on how to measure logs and what allowance to make for defects of various kinds.

Gain in Mill Cut Over Log Scale.

Would like to know if there is any increase on logs scaled by the Scribner rule and sawed by the band saw, say logs scaled for the full contents, not including the No. 5 boards?

Logs sold by the Scribner measurement or any other established rule belong to the buyer. Recognized standards by which logs are estimated are for probable

amounts of lumber they will produce. As a usual thing the customer has to deduct certain amounts for standard defects and this question is left largely with the scaler. Having purchased the logs on this basis, however, the mill man cannot be expected to give an account of the manner in which they are reduced to lumber. After a transaction has been concluded the former owner has no interest whatever in the future of the articles sold. If, as intimated, the saw mill man by the use of a band saw is able to secure more lumber than formerly was possible that is a matter in which he alone is interested because he naturally would have the right to cut whatever logs he might buy with a band, a circular, a muley saw—or an ax if he so desired.

It is a well established principle of equity that the conditions of a contract having been understood and fulfilled the transaction shall be binding and that title to the property transferred without reservation shall rest with the purchaser and he may retain it without let or hindrance on the part of the purveyor. If there is injustice worked by the application of present log scaling rules it must be adjusted by changing the rules and not by an endeavor to rescind contracts that have been made based thereon.

Doyle-Scribner Rule.

What is the combined Doyle-Scribner log rule and wherein does it differ from the Doyle or the Scribner rule?

The Doyle-Scribner system uses the Doyle rule on logs twenty-seven inches and under and the Scribner rule on logs twenty-eight inches or more in diameter. For convenience a statement is given showing the Doyle and Scribner inspection and how the Doyle-Scribner is arrived at. The basis for comparison given is a log sixteen feet in length, of varying diameter:

INCHES DIAMETER—	Doyle rule.	Scribner rule.	Doyle- Scribner.
Sixteen	144	159	144
Seventeen	169	185	169
Eighteen	196	213	196
Nineteen	225	240	225
Twenty	256	280	256
Twenty-one	289	304	289
Twenty-two	324	334	324
Twenty-three	356	339	359
Twenty-four	400	404	400
Twenty-five	441	459	441
Twenty-six	484	500	484
Twenty-seven	530	548	530
Twenty-eight	576	582	582
Twenty-nine	625	609	609
Thirty	676	657	657
Thirty-one	729	710	710
Thirty-two	784	735	735
Thirty-three	842	784	784
Thirty-four	900	800	800

The Doyle-Scribner system of computing the contents of logs has been adopted as the official standard of the National Hardwood Lumber Association and of the Hardwood Lumber Manufacturers' Association of the United States and is used generally by the hardwood fraternity.

Log Scaling Rules.

We are buying and cutting timber under a contract requiring logs to be scaled on skids at mill pond—all merchantable pine that will square 6x8—16'. Log scaler insists that we must accept all logs at full scale regardless of crooks, rotten heart, knots and similar defects. He also scales from outside to inside of bark. We contend that defects should be deducted and scale taken inside of bark. Kindly advise as to usual custom. When diameter of log on scale rule comes between figures on rule, is the lower figure always taken or the average?

Briefly it may be said that all logs are measured at

the small end inside of the bark. This method of measuring is based on the principle that a greater amount of lumber cannot be obtained from a log than can be cut from the small end and as a general proposition this holds good. For defects and crooks there are no standard rules, the deduction being made in accordance with the ideas of the scaler, who from long experience is able to tell almost at a glance what percentage of loss will be caused by any defect. Crooked logs are measured on the basis of the amount of lumber they will produce the full length of the log and whatever material can be made from the slabs and short ends cut off in squaring up the sticks are perquisites of the manufacturers and unless the material is very valuable the operator does not get more out of their sale than enough to pay cost of manufacture.

Log Scale—Thousand Feet.

Can you give us the meaning of "a thousand feet" as applied to the measurement of logs and as used by the timber trade both in this country and Canada? What we want is a definition of the term as it is understood by the dealers.

We of course understand what is meant by a thousand feet board measure. Does it mean a thousand cubic feet with the bark on or off? If not, what does it mean?

In measuring logs the term "thousand feet" signifies the estimated amount of lumber, board measure, which the logs will produce. Logs are measured in various parts of the country on different bases. In taking measurement of a quantity of logs the scaler measures inside the bark at the small end of the log, if it be of ordinary length, or, according to some rules, with calipers in the middle of long logs. The lumber dealer or consumer has nothing to do with log measure-

ment. It is a matter which interests the logger and the lumber manufacturer solely.

A number of log measuring schedules have been provided which are used in various parts of the country and nearly all of which differ in some particular, some giving the manufacturer an apparent advantage and others being in favor of the logger. All of these rules were gotten up on the basis of how much lumber could be made from a straight log of specified size. In order that the correspondent may appreciate the difference in the various rules which are used by lumbermen a table has been prepared showing such variation, the extension being for a log sixteen feet long and sixteen inches in diameter:

RULE—	Contents in feet.
Doyle	144
Scribner	159
Scribner two-thirds	150
Cumberland River log scale.....	106
Dusenberry	136
St. Louis hardwood scale.....	150
Pacific coast scale.....	161

Logs are not figured on the basis of cubic feet except for valuable cabinet woods that have been squared or otherwise prepared for the use of the furniture maker. The basis has always been on the amount of inch lumber that the log would produce and provision is made for waste in manufacture. As will be noticed from the example cited in the table given the number of feet of lumber that can be produced from a log of given size varies and it is a fact that there is a variation in the amount of lumber that is made from various kinds of logs. Crooked logs and logs with other defects are measured on a somewhat different basis and no hard and fast rule has ever been devised for ascertaining the amount

of lumber they contain, the experience and judgment of the scaler being relied upon to a large extent. The correspondent states that a perfect understanding exists as to what is implied by the term a thousand feet board measure and in this he has knowledge greater than that held by many lumbermen, which is proved by the disputes which constantly arise over what constitutes a thousand feet of lumber, board measure.

Comparison of Scaling Rules.

Please give a comparison of the various log rules.

A great variety of rules have been in use and many are now obsolete. Some of the states have by legislation legalized a particular rule. The following table gives the number of feet in 16-foot logs of eight, sixteen and twenty-four inches diameter, respectively, by forty-three rules:

NAME OF RULE—	8-inch.	16-inch.	24-inch.
Scribner	32	159	404
Doyle	16	144	400
Doyle and Scribner.....	16	144	400
Holland or Maine.....	44	179	439
New Hampshire	46	184	414
Humphrey or Vermont.....	43	170	384
Bangor	41	182	444
Cumberland river .....	..	121	268
Hanna	32	160	416
Spaulding .....	..	161	412
Favorite .....	..	142	392
Baxter	34	156	366
Doyle and Baxter .....	..	144	366
Square of three-fourths.....	48	192	432
Square of two-thirds.....	..	150	341
Drew	*	*	*
Herring	25	142	344
Dusenberry .....	..	136	346
Orange river .....	..	136	308
Chapin .....	..	144	374

NAME OF RULE—	8-inch.	16-inch.	24-inch.
Northwestern	33	170	392
Derby	49	195	438
Partridge	46	180	416
Parsons	41	179	433
Ropp .....	..	157	413
Stillwell .....	..	176	385
Baughman's rotary saw.....	41	193	457
Baughman's band saw.....	41	209	500
Saco river	49	192	436
Ballou	40	170	...
Wilson	46	184	448
Wilcox .....	..	144	373
Warner	30	128	316
Boynton	32	170	384
Carey	†	†	†
Forty-five	38	168	415
White	30	161	402
Finch and Apgar.....	..	157	400
Constantine	67	268	603
Ake	41	167	377
Quebec	32	160	420
British Columbia .....	..	160	386
New Brunswick .....	..	170	432

*No values given below 20 feet.

†No values given over 15 feet long.

Log Scale Versus Mill Cut.

We are having considerable argument and discussion regarding the proper scaling of logs and the reasonable and natural gain in the mill cut of said logs over the log scale; first when sawed with the ordinary circular saw taking out 5-16-inch saw kerf and the additional gain that would accrue in sawing such logs with band saws taking out $\frac{1}{8}$ -inch saw kerf.

Our information is that where logs are purchased on the Susquehanna river and elsewhere by log scale and are sawed by circular saws the gain is usually 10 to 12 percent over the log scale. This is principally in hemlock and white pine, logs which in that section contain but few defects.

Our understanding is that the combined Doyle & Scribner

rule which we use was originally based on the Doyle & Scribner rules of the sawing of all logs into 1-inch boards, allowing for the thick saw kerf of the circular saw mill. Therefore if boards are sawed 1 1-16 inch thickness and allowed to dry about one inch what should the gain be over the log scale? No logs longer than sixteen feet used. Again, what additional gain should accrue from the use of band saws on the same logs instead of circular saws?

We are also manufacturing southern white pine, hemlock, poplar, white oak, chestnut and basswood logs, where logs are scaled if anything more strictly than they are in Pennsylvania for sound and straight. What would be your impression of the proper gain in that locality?

Is it customary among saw mills to include any of the mill culls or scoots in the mill cut tally? We would suppose that such pieces were those that represented dockage by the log scaler from defective logs.

So much would depend on the size of the logs and their freedom from defects which would tend to lessen the amount of lumber produced that no one would care to undertake to answer in detail the questions asked. As a matter of fact there is no known means of getting at this subject except through the records of mills which keep strict account of the log scale of all the timber they cut and an equally accurate record of the lumber made. This, however, could show only the average for a day's or a week's operation and not for the individual log, unless a special effort shall have been made to trace the log from the time it was sent into the mill until it emerged therefrom in the form of lumber. Probably a number of the mills do keep such records.

Undoubtedly the log scale would be surpassed to a greater extent where a band saw taking out a kerf of only 1/8-inch was used than where the same logs were cut by a circular saw with a 5-16 inch kerf. The gain, however, would probably be proportionately greater on

large logs than on small on account of the additional number of cuts required to turn it into lumber.

It is in many districts customary to keep strict account of the mill culls or scoots turned out; this should be done by all mills, as it takes about as long to cut them as it does to cut lumber and they form a part of the mill's output which should be accounted for.

Accuracy of Doyle Rule.

Does the Doyle log rule give accurate contents of a log, and if not, in what is it inaccurate?

The Doyle scale, while probably more extensively used than any other, does not give the actual contents of a log. To date no system of log measurement has been devised which will give accurate log contents and both loggers and millmen figure on an overrun which probably will average close to 25 percent. The Doyle rule under-scales on small logs—say, logs 27 inches or under—and over-scales on logs from 27 inches up; that is, comparing it with Scribner and other similar systems of log measurement.

Extension of Scribner Scale.

Is there any way of extending the Scribner log rule to cover a log 54 inches in diameter and 10 to 12 feet long? The rule mentioned measures up to only 48 inches in diameter.

Probably the only method of extending the rule to cover a log of the size mentioned would be to figure the cubical contents of smaller logs and find the relation between the number of board feet and the cubical contents. Then by ascertaining the cubical contents of the larger log it would be possible to estimate the number of board feet. The Scribner scale represents between

67 and 69 percent of the cubical contents of the log—say an average of 68 percent. By taking 68 percent of the cubical contents of the log mentioned it would be possible to ascertain something like the number of board feet it contains. The more exact way, however, would be to compare the contents of logs of all diameters given with their cubical contents in order to ascertain the exact percentage the log scale is of the cubical contents. After finding the relation between the cubical contents and log scale in smaller logs it could easily be extended to cover larger ones.

Log Scale Disregards Fractions.

What is the custom in scaling logs regarding fractions?

The ordinary method employed when using the Scribner-Doyle log scale is to measure the smaller end of the log from inside to outside of bark and ignore fractions. There are, of course, a number of log-scaling systems recognized as standard and others that are used to some extent but which are not generally known. It is possible that fractions are sometimes used in some log measurement computation but the ordinary practice is as here stated.

Crayon for Wet Logs.

What is the best composition to use for the marking of ends of logs as they come out of the water?

Waterproof crayon composed of tallow and lamp wick, or of tallow and red, green or blue pigment is manufactured by a number of the pencil-making companies and is kept in stock by many of the large stationers. They are known as lumber crayons and may be so ordered.

To Measure Stream's Width.

How can the width of a stream be measured?

Stand at the edge of the stream and lower the brim of your hat until the edge cuts the bank on the opposite side, turn around carefully and mark the spot where the brim of the hat touched the ground. Measure this distance. If you have a hat and can hold your head steady the width of the stream can be ascertained approximately.

Rafting on the Mississippi.

What is the method of rafting on the Mississippi?

When the first rafts were sent down the Father of Waters the only power employed was the current and the rafts were guided by men armed with long poles, located at either end of the raft. Later, rafting by steamboat came into vogue. These boats were well built, sternwheelers equipped with powerful engines and electric searchlights and were generally of heavy design. The mode of operation was for the boat to push the raft ahead of it, at the same time keeping it in the channel, with little or no assistance from the men in charge.

A Wangun.

What is a wangun?

A storekeeper in a logging camp is called a wangun. As a rule, he is either the operator himself or someone hired by the operator, and during the winter he conducts a credit business, selling a little of everything to the loggers, with the result that in the spring much of what is coming to the woodsman is also coming to the wangun.

Scaling Rules.

I have recently sold some white and red oak timber log run and I find that the Hardwood Manufacturers' Association's rules say that log run means the full run of the log with all grades below No. 3 common cut. I understand this to mean that all boards or pieces including No. 3 go in log run. Also that a piece to grade must have 25 percent clear in it. Must the 25 percent clear all be in one place or may it be in three places or pieces and on one or both edges?

No. 3 common largely is used for cutting up stock. It is expressly provided in the rules of the Hardwood Manufacturers' Association of the United States that at least 25 percent of No. 3 stock must be clear face and that no portion of this 25 percent must be less than $\frac{1}{2}$ foot surface measure. Were the principle admitted that the entire 25 percent must be in one piece then if sizes were adequate the grade would be raised, making the No. 3 a No. 1 or first and second. The rule on this grade is very clearly stated:

No. 3 common—The lengths are 4 to 16 feet. The widths are 3 inches and over and must contain at least 25 percent of clear face cutting. No piece or cutting to contain less than $\frac{1}{2}$ foot board measure.

According to the general understanding of the term the product of a mill log run means everything that has a shipping value. In the case presented by the correspondent it would not matter if all the lumber was No. 2 and No. 3. The buyer is supposed to know approximately what kind of lumber is to be cut and about what grades it will make. Log run, according to the rules of the Hardwood Manufacturers' Association of the United States, divides on No. 3. It is clearly stated on page 10 of the association rules that log run means the full run of the log with all grades below No. 3 common cut.

PART V.—THE SAW MILL.

HISTORICAL.

First Saw Mills of Record.

Have you authentic record of the first saw mill built in any country?

History records the operation of a saw mill on the island of Madeira in 1420, which is also about the date of the introduction of a saw mill into Europe. A statement, although of doubtful authority, is to the effect that a saw mill was operated on the River Roer, in Germany, in the fourth century; indeed there are some Egyptian monuments upon which appears a fair representation of a diamond toothed circular saw for cutting stone, which is supposed to have been in use about the time that King Rameses flourished on the Egyptian throne—two or three thousand years before the birth of Christ.

In 1555 the Bishop of Ely, sent by Princess Mary of England as an ambassador to the court of Rome, wrote a description of a water mill which he saw at Lyons, France. According to his story the mill was operated by an upright water wheel, the water being sent through a trough.

The first saw mill in England was built in 1663, but the people conceived it to be a device of the devil and destroyed it. It took many years to overcome this idea and the succeeding one, which was that the mill was the agency through which a dozen men were

thrown out of employment, and in consequence the pioneer English saw mills were torn down almost as fast as they were built.

First Saw Mill in the United States.

Where was the first saw mill operated in the United States and when?

The first mill of which there is any authentic record was at South Berwick, Me., and was built in 1623, although it is possible that there were mills operated by wind mills on Long Island prior to that date. If there were any, however, they were not successful. The presumption is that the wind mill idea was brought over from Holland by the Dutch then colonizing the state of New York. The capacity of the South Berwick mill is not known, but probably it was not more than 1,000 feet a day. A saw mill was built near the present site of Portsmouth, N. H., on Salmon Falls river about 1633.

First Pacific Coast Saw Mills.

What were the first saw mills on the Pacific coast?

A saw mill was built at Bodega, Cal., some time prior to 1846, it being in operation in that year. It was built by Russians and in December, 1848, was purchased by a pioneer lumberman from Connecticut who at the same time bought the brig *Sabine*, which he used in carrying lumber to San Francisco. In 1850 Harry Meiggs had a saw mill at Bodega and two years later built one at Mendocino, credited with representing an outlay of \$200,000. This mill proved a failure, however. In 1851 J. J. Folt built a mill on Puget sound which was located at Apple Tree cove, near Fort Madison. In 1852 Sayward & Thorndyke

erected a mill at Port Ludlow which afterward was sold at Amos & Phinney. The first lumber mill in Oregon was built by Lott Whitcomb and Meek & Llewellyn in 1849. It was a water mill which was located at Milwaukee, about six miles from the present city of Portland.

Largest Walnut Saw Mill.

To settle a dispute will you kindly advise as to the location of the largest walnut mill in the country?

The distinction probably belongs to East Chicago, Ind., where 5,000,000 to 6,000,000 feet of walnut is cut each year by the Lesch, Prouty & Abbott Company. The product is distributed in all parts of this country and a very considerable part is exported.

First Saw Mill at Merrill, Wis.

When was Merrill (Wis.) settled?

If by settled is meant when lumbering began, one does not have to seek far for an answer. Andrew Warren is credited with having erected the first mill at that point in 1847, rather to have begun preparations for it by throwing a dam across the rapids knowns as Bull's falls, later christened Jenny Bull falls and still later Jenny falls. The dam gave adequate water power for several mills. The Warren mill was completed in 1849 and was equipped with one Mulay saw, capacity 4,000 to 5,000 feet daily. The first lumber cut, aside from that used locally, was rafted down the Wisconsin river to the Mississippi and sold at Galena, Ill. This lumber brought, at the mill, \$6 a thousand; at Galena, \$28 a thousand. It cost \$6 to raft it, leaving a profit of \$16 a thousand, rather a tidy overturn for the pioneer wholesaler.

Merrill has been one of the more important points of lumber manufacture in Wisconsin since this early date and continues to hold its own remarkably well. When production was at its high, 1892 to 1896, the output was about 150,000,000 feet of lumber and 85,000,000 shingles. The output now largely is hemlock and hardwoods.

When the Vance (Eureka, Cal.) Mill Was Built.

Can you inform me when the "Vance" mill was built at Eureka, Cal.?

The mill now known by that name is of recent construction and is equipped with modern machinery. The "Old Vance" mill was put up in the spring of 1853 when the lumber industry of the coast was in its infancy. It was owned and operated by Capt. Ridgeway and Alvin Flanders, the latter afterwards governor of Washington Territory. The original equipment was the old fashioned sash and jig saws and a pony and single circular for edging, but its operation was not profitable until purchased by John Vance in 1856. This was one of the historic mills of the coast. The output was about 35,000 feet a day and it was run practically without stopping thirty-eight years, producing in that time 412,000,000 feet of lumber.

Saw Mills of Switzerland.

What is the character of the saw mills operated in Switzerland?

Like those of every other country, some good, some poor. They are not all of the type described by an American lumberman visiting in the Alps. What he declared was considered to be a satisfactory and up-to-date Swiss saw mill was run by a small water wheel,

although there was approximately 1,000,000 horse power in the stream. Four men were required to turn the log, which was sawed by a small jig saw. The water wheel was so small that it almost stopped when the saw hit the log. The visitor watched while one board was cut off and found it to be a wormy cull of some unknown hardwood. He said he would have liked to have stayed to see the finish of the log, but that he had to get back to town that night and that at the rate of progression in cutting the first slab he imagined that if everything ran smoothly they would finish the log sometime the following afternoon.

First Saw Mill on the St. Croix.

What was the first saw mill built on the St. Croix river?

In 1838 Judd Walker & Co. built a saw mill at Marine Mills, in the St. Croix valley. This is believed to have been the first factor in the saw mill industry on the St. Croix river.

Colonial Laws Governing Operation of Saw Mills.

Were there any limitations imposed by the colonies upon the operators of early saw mills?

In 1641 the general court of Massachusetts adopted a system of laws known as the "body of liberties," one of the provisions of which was that there should be no monopolies but to such new inventions as were profitable to the country and then for a short time only. Under this provision a saw mill was erected in 1656 at Scituate, the operations of which were governed by the following regulations:

That in case any of the townsmen do bring any timber into the mill to be sawed the owners of the mill shall saw it, whether it be for boards or plank, before they saw any of their own timber; and they are to have the one-half for

sawing the other half. And in case, any man of the town that doth bring any timber to the mill to be sawed shall want any boards for his particular use, the owners of the mill shall sell him boards for his own use, so many as he shall need, for the country pay at 3 s. 6 d. an hundred inch sawn; but in case the men of the town do not supply the mill with timber to keep it at work, the owners of the mill shall have liberty to make use of any timber upon the Common to saw for their benefit.

Where Is the Biggest Mill?

Where is located the largest mill in this country?

It is difficult to determine which is the largest mill in the United States today. Within recent years so many large plants have been erected that several might lay claim as the premier mill. The criterion should be the daily capacity to turn out lumber in each instance. Time was when the Chippewa Lumber & Boom Company's mill, at Chippewa Falls, was regarded as the one of largest capacity in this country, having been capable of turning out 350,000 feet a day. The output was about 60,000,000 feet of lumber in 1903, probably on account of a decline in log supply, whereas it used to turn out over 100,000,000 feet.

The Alger, Smith & Co.'s mill at Duluth, Minn., is one of the giant plants of the country. One season it sawed 108,000,000 feet of lumber.

The C. A. Smith Lumber Company, of Minneapolis, has a mill that in 1903 turned out 180,000,000 feet of lumber, which thus beat the Alger, Smith & Co.'s mill by 72,000,000 feet. But the annual output in each instance does not determine the actual capacity of the mill. The daily runs in any mill differ according to circumstances, such as the size and character of the logs and the kind of stuff the logs are cut into. It would require an expert examination to determine the

superiority as between two or more mills in case they were nearly alike in machine equipment, power and facilities for handling logs and lumber.

In the south the Central Coal & Coke Company's mill at Kennard, Tex., is among the big ones. It is equipped with three band saws and a double head gang.

The Port Blakely Mill Company's mill, at Port Blakely, Wash., is one of the moguls on the Pacific coast, though whether it is the record maker we have not the data at hand to prove. Anyway, it is known that this plant in one year turned out 120,000,000 feet of lumber.

Two late additions to the "largest saw mill" class are the Potlatch Lumber Company's plant, Potlatch, Idaho, and the Great Southern Lumber Company mill, Bogalusa, La.

Starting a Saw Mill in New Mexico.

For my information will you reproduce the article describing the starting of the American Lumber Company's mill at Albuquerque, New Mexico?

For your information it is reproduced.

It happened in this manner: In the early morning hours of Monday, October 26, 1903, a man was prowling around the engine room of the American Lumber Company's new plant. He stumbled over a projection in the gloom; there was a hissing roar as of ninety-nine tomcats at a concatenation. The displaced lever was admitting torrents of superheated steam into the cylinders of the, until then, silent monster which was warming its blood and belaboring it into a frenzy of excitement. This lasted for a few seconds only and then with a move that sent an anticipatory thrill throughout the building, the race began.

The engine started it, of that there can be no doubt, but much of the responsibility rests with the boilers for it was under their influence that the engine acted in the manner it did. The flywheel, which was predestined to lead a fast life, felt it obligatory to surpass the example set. The flywheel is, of course, irresponsible and showed its susceptibility to the influence of others by whirling 'round and 'round in a giddy and bewildering fashion.

The excitement did not end here; however. The driving shafts in an endeavor to deserve the appellation that had been given them, creaked, groaned, rubbed the newness from their joints and began to revolve. They could not see the wild abandon of the flywheel, but the air was impregnated with the electricity of motion and it was for that object that the driving shafts had their existence.

But a few seconds had passed since the man stumbled over the lever in the engine room. Up to this time the excitement had been confined to the ground floor. It was soon communicated to the upper region, where the family connections of the main driving shaft had their abode. Then was to be noted the effect of proximity. The band saws struck up, the carriages rolled back and forth, rolls became imbued with life, cutoff saws snarled, the trimmers primped and peeped forth wickedly at the slashers, which were revolving in a circle of reflected light.

All of these acts of the various parts of the mill occupied less than thirty seconds from the time of the mishap in the engine room. The "jacker" at the tail of the mill, regarded by all as belonging to the laboring class, met with an obstruction and being unable to disentangle its hold, lifted it bodily and carried it upon the deck, where it besought the help of the

"kickers." The "kickers" were in a good humor, having been freshly oiled that morning, and speedily relieved the "jacker" of its load.

Now, it so happened that in relieving the "jacker," the "kickers" had endeavored to even up an old score with their erstwhile friends, the carriages. The cumbersome burden that had fastened itself upon the "jacker" was hurled bodily down a sloping platform and landed on the stationary carriage below. The carriage trembled in its anger; then it bit deeply into the soft bark of the burden thus imposed, but finding no means of getting rid of its load, it rushed madly forward crying for succor to the band saw. The band saw smiled its grim welcome. Deep into the heart of the pine it buried its teeth with a shriek that caused all the others to pause in momentary consternation. Its bite was deep and one entire side of the pine was shorn away. The rolls rumbled along and catching up the fragment carried them forward, and the saw that runs horizontally took its turn and the edgers worked their will, the trimmers bore a hand in the carnage until there was little left for the hungry slashers. All lent their assistance to the destruction of the lordly pine, until its parts were distributed over the entire home of the members of the machinery family and the waste sent to the pit where the fire burneth and is not quenched.

The "jacker," the original cause of all this furore, properly should be called a joker, for no sooner was it rid of the first burden than it caught up another and another and another, and it is said that until this day it is carrying burdens to the deck that it can only rid itself of through the assistance of the "kicker" and the process which subsequently follows.

Average Life of Saw Mill Town.

What is the average of life of a saw mill town?

There isn't any. The range is so great that it is impossible to give an average. Some of the best and largest towns in the north were "saw mill" towns originally.

It is commonly understood that the saw mill, as a manufactory, is rather an ephemeral affair as compared to plants engaged in other kinds of production. The lumber business as a whole is regarded as a temporary industry that will last only a few years, or until the tributary timber shall be cut off. Towns built up under the influence of lumber manufacture are sneeringly dubbed "sawdust burgs," which is as much as to say that they are liable to be whisked out of existence by the winds or swept out in some accidental conflagration. This proves to be a mistake in numerous instances, as witness Saginaw, Bay City, Muskegon, Manistee and Menominee, in Michigan, and Oshkosh, Marinette, Wausau, Merrill, Marshfield, Eau Claire, Ashland, Superior and other places in Wisconsin, besides several in Minnesota, which have passed the sawdust period and remain substantial towns of varied industries and of commercial importance.

Neither is the saw mill necessarily and absolutely a thing of short life. One old mill in Pennsylvania stands today as a refutation of the slander against its kind. At Friedensberg, near Boyertown, Berks county, Pa., is a saw mill that was built in 1735 by Jean Bertolet, and it is running yet. The mill, together with an old house, has been handed down through generations in the same family, and its present owner, Israel Bertolet, is the fifth in succession. The Oley hills and the valley from which the mill has drawn its supply

of timber have been famous in history. The ancestors of Daniel Boone lived but a short distance from the Bertolet mill.

Here is an example of a saw mill antiquity that should at least partly redeem that useful agency of civilization from the charge of a transitory character. This old mill has been in operation for nearly 170 years, and not many manufacturing plants in this country have done duty so long as that.

This suggests something. When the principles of forestry shall become fully applied, so that tree growth shall be fostered on lands better adapted to a forest crop than anything else, it will become possible to maintain saw mills from generation to generation, and even as long as wood grows and waters run.

Wages in the West.

What are the advantages or disadvantages, as the case may be, of the northwest territories from a workman's standpoint. What is the cost of board and lodging in the country, town and city? What are the salaries of the men filling the various positions in the lumber, mercantile and railroad business?

In the northwest as in other sections of the country the remuneration received by any class of workmen largely is regulated by ability. There is perhaps greater opportunity in a country under process of development than in older districts, but only those who are willing to work earnestly and conscientiously can hope to achieve results in a new or in an old country. A man cannot expect to get into the northwest states—taking for granted that the query refers to our own country—and carve out a fortune in a few years, but application there will perhaps receive a greater reward than in many other districts.

Each section of the United States has its own peculiar advantages and disadvantages. One of the greatest advantages in the northwest is the climate, which evidently the correspondent has not deemed of sufficient importance to consider. In so far as the matter of remuneration is concerned, however, wages generally are higher in the west than in other parts of the country. Wages also were higher in the country and small towns than in the cities. Ordinary labor at lumber mills in Seattle and Tacoma was paid in 1903 at the rate of \$1.75 to \$2.25 a day and skilled labor \$2.50 to \$8. In the logging camps and smaller districts it was necessary to pay \$2 to \$2.50 for common labor and \$3 to \$10 for skilled workmen. Wages in 1906 were 10 to 20 percent higher. Wages are regulated largely by the character of work and ability of the employee.

In logging camps men are furnished board by the operator at a fixed sum by the week, usually \$4.50 to \$5. In addition to this a hospital fee ordinarily is collected and the workmen have but very little expense of any other kind. It is quite possible that the cost of board in the small towns would be about the same, though, of course, the character of the accommodations desired would have much to do therewith as would also be the case in large cities. No information in regard to the salaries of railroad employees is available and the salary of an office man naturally is regulated largely by what he is worth to his employer.

OPERATION.

How to Record Weekly Production.

Please inform us if there is any method commonly used by the producers of lumber for recording weekly productions. We desire a book that will enable us to keep a record of each size, length and quality, and a similar record of the sales of this stock.

It is presumed every lumber manufacturer has some manner of keeping track of the amount of lumber cut each week and the amount sold. A method which

Week Ending	2X4-10			2X4-12			2X4-14			2X4-16			2X4-18			2X4-20		
	CUT	SHIP	ON HAND	CUT	SHIP	ON HAND	CUT	SHIP	ON HAND	CUT	SHIP	ON HAND	CUT	SHIP	ON HAND	CUT	SHIP	ON HAND
Oct 13																		
Oct 20																		
Oct 27																		
Nov 2																		

A SUGGESTED METHOD.

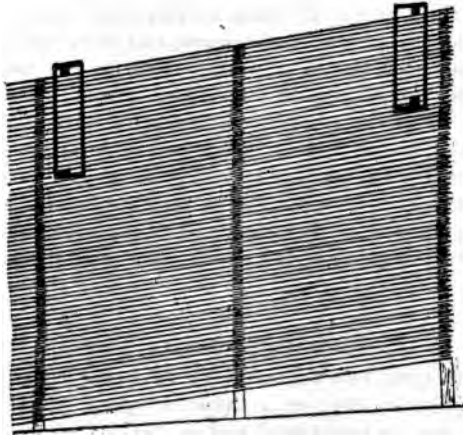
should give satisfactory results is the form given herewith, which could be made up into a book, a page to be devoted to the different lengths of each size and the headings so arranged that each length would be given a separate column.

To Fasten Down Lumber Piles.

Please suggest a satisfactory method of preventing lumber piles from being scattered by the wind.

The device illustrated is probably the most satisfactory method of holding down the top of a pile, and has proved satisfactory where used. It consists of a temporary roof of stock laid to break joints on the

edges of the boards and thus form gutters to carry away the rain water before it can seep into the pile. The short board shown is driven forward toward the end of the pile and clamped down so as to produce



PILE TOP BINDER.

a continual pull resulting from the strain on the angle iron. The device is an inexpensive one and is proving satisfactory.

What Sawing Reports Should Show.

What should the sawing report tell?

A dandy sawing report, when properly recorded, is the basis upon which all profit and loss computation can be based. If the sawing report is kept properly the mill man, by a glance at it, can gain a better knowledge of the day's work than he could have obtained had he been in the mill all day and watched

every board as it left the saw. It is not sufficient in this report that the total cut and the amounts of each grade should be given. For example, "10,000 feet of cull" does not tell the story. The sizes should be itemized. The sawing report should be copied into an office book and at the back of this book pages should be ruled off into as many columns as there are grades and kinds of lumber. In these columns the totals of the day's work should be entered and at the end of every month the amounts added up and the percentage which each column bears to the total set down. If a report of this kind is kept it is possible for a mill man to review his day's, month's or year's sawing operations at any time and settle positively and definitely any question which may arise regarding them.

Chemical Prevention of Bluing.

Is there any known preventative for lumber bluing?

If about a third of a barrel of quick lime be put into a box or half barrel and one of the latter placed beneath each lumber pile the chemical action caused by the air coming in contact with the quick lime will prevent the fermentation which causes lumber to blue.

To Prevent Lumber from Bluing.

What is the best way to prevent lumber from bluing?

Bluing is largely due to the climate in which lumber is manufactured. It often can be prevented by extra care in piling the lumber. The yard should be so built as to be open to the wind and should slope to assist drainage, which should be good, especially under the piles. The piles should have an open foundation built up at least eighteen inches from the ground. In short,



HOW THE CHINESE SAW LUMBER.

the lumber should be so piled as to permit the air to pass between the boards as freely as possible and everything should be done to insure good drainage. If under these conditions the lumber still blues the only thing to do is to put it through the dry kiln direct from the saw.

How the Chinese Cut Lumber.

A friend called my attention to an illustration in the December 19, 1903, issue of the **AMERICAN LUMBERMAN** showing the primitive Chinese method of manufacturing lumber. If possible I would like to secure several of these papers. If you cannot give me a number of them I would like to have one at least to file for reference.

The illustration inquired about was made from the picture presented to the **AMERICAN LUMBERMAN** by Francis R. Wardle, who for a number of years acted as oriental agent for one of the big Pacific coast lumber manufacturing institutions. He is probably one of the best posted men on the oriental lumber situation in this country. In regard to this picture he said: "You can see by this photograph something of the method used by the Chinese to cut lumber. It seems incredible, but steam saw mills cannot compete with this primitive method."

Wisconsin Quarter Sawed White Oak.

Will you kindly ascertain for us and advise at your earliest opportunity, the present wholesale price of Wisconsin white oak in the Chicago market?

Inquiry among dealers in this city who handle Wisconsin oak as a specialty calls out the statement that little Wisconsin white oak is quarter sawed with a special market view. In all hardwood lumber a little edge grained stuff can be picked out, but there is not enough white oak of that sort in Wisconsin to cut

any figure as a market factor. There are no quotations of prices here on that description of lumber. No doubt quarter sawed Wisconsin white oak could be put in with southern stock and be made to go in sales, but it never would be separately priced.

To Prevent Boilers Burning.

What should be done to prevent a boiler burning or bursting when short of water, with a heavy fire at the grate?

The best plan is to throw wet ashes on the fire, which gradually decreases the heat. To rake the fire out intensifies the heat for a short period of time, often causing the very disaster which it is intended to prevent.

Utilizing Refuse.

Would it pay to establish a plant in connection with a saw mill for the manufacture of small wooden articles from material which ordinarily goes to the refuse burner?

This plan has been tried in some places and proved profitable, but its success, of course, would depend entirely upon the character of the plant and the way it was run. Probably a better plan would be to make special stock from the best of the refuse for wood-working factories.

Manufacture of Oak.

With a considerable quantity of white oak stumpage to manufacture, which would be better in the long run, to cut lumber or staves, the cost of mill equipment and net proceeds only to be considered?

With a good quality of white oak stumpage it probably would pay better to install a band mill and auxiliary machinery to work up waste stock into staves and heading. In this way the logs can be sawed to the best advantage. Those which are suitable can be

quarter sawed, while the balance can be cut into plain oak lumber while the side cuts and short stock left from the saw mill would work up into staves and heading, which bring good prices.

On the other hand, if a stave plant were installed, the result would be considerable waste of stock which would prove unsuitable for working into staves. The installation of a band mill with a filing room and auxiliary machinery etc., would cost from \$15,000 to \$20,000, for a plant cutting 35,000 feet of plain sawed or 20,000 feet of quarter sawed lumber a day. If there is sufficient timber to keep such a plant running for a reasonable length of time it would undoubtedly be profitable.

Quarter Sawing Logs.

In quarter sawing oak does it pay to use inferior logs?

This is a matter which is governed entirely by prices as, of course, the higher the proportionate selling value of quarter sawed oak the poorer the logs that could be so manufactured at a profit. On the present price basis logs, cull out, which are to be used for quarter sawing should run from 50 to 60 percent to uppers.

Quarter Sawing Explained.

Will you tell me how mills making a specialty of quarter sawed lumber are run? Is the log quartered by a rotary or band and then sawed into boards on another saw so as to get the grain in every board within 45 degrees of the vertical, or are the boards sawed off as they come, and those with the vertical grain separated?

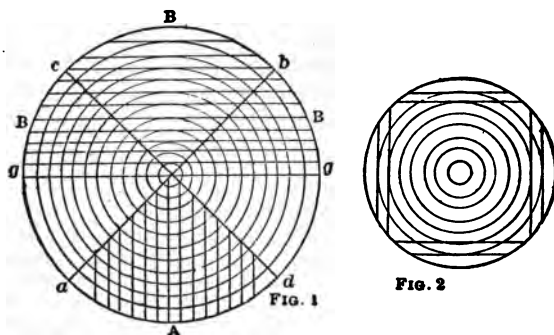
First we will say that quarter sawed, rift sawed, edge grained and vertical grained, as applied to the lumber, all mean the same thing. In cutting any kind

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of timber into lumber there always will be a percentage of vertical or edge grained product. These can be sorted out and separated from the flat or bastard sawed stuff, making a collection of quarter sawed lumber. Much of the edge grained flooring and ceiling in yellow pine is secured in that way, though a good deal is specially sawed.

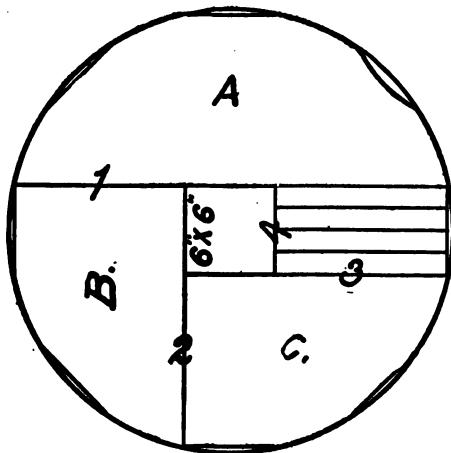
The advantage secured in quarter sawing oak or any other wood of pronounced grain is in thus obviating shrinkage or warp. A more permanent surface for cabinet finish and greater durability where wear is involved can also be secured by quarter sawing the wood, which leaves the edge of the grain or the hard summer growth in greatest superficial exposure as distinct from the softer pulp growth of the cooler season.

The original method of quarter sawing was to cut the log lengthwise into four quarters, as seen in Fig. 1 of the following diagrams:



The lines a, b, c, d are those on which the log is supposed to be quartered. The circles represent the concentric rings of the tree's growth. The straight

lines across the upper half of the log B show the ordinary method of slicing it up into boards with a circular, gang or band saw. Wherever the cut of the saw crosses the circles at right angles, or nearly so, that much of the board is rift sawed; when it runs nearly parallel with them it exposes the grain, and is what is termed flat or, less elegantly, bastard sawed. The board nearest the middle, g, g, will almost be a perfectly rift cut piece, while the fourth one from it toward the outside will be about half rift and half bastard. Supposing the lower quarter, A, to be cut out from the log, the common and most simple method

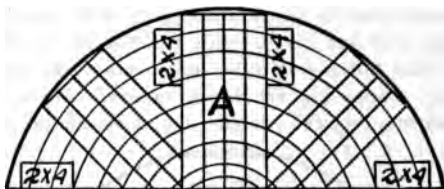


NO. 5.

of quarter sawing is to make the cuts as shown by the straight lines which cross the concentric rings at sufficiently near right angles to make good flooring or other edge grained lumber. Each piece, however, will have a bevel edge, as shown, which must be

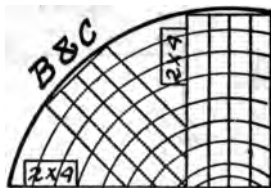
squared by the edger. Special arrangements of mill carriage and headblocks are in use for rift sawing when great accuracy and perfect work are desired.

The methods of quarter sawing adopted and advocated by experienced sawyers are several. The following are the most improved plans:



NO. 6.

One way is to halve the log, put one-half back on the deck and place the other with the half round on the carriage and against the knees toward the saw,



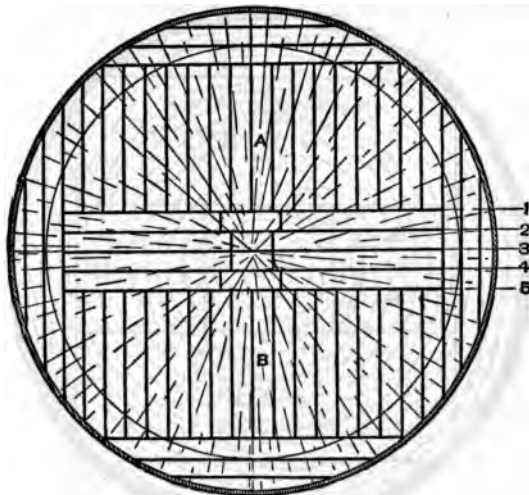
NO. 7.

with an angle of 45 degrees. Cut off boards until the heart is reached; then turn down the sides against the knees until the last surface cut is at an angle of 45 degrees, and cut as before. Turn down again in the same direction another eighth turn and repeat. Thus each half of the log takes four positions.

Diagrams 5, 6 and 7 show how the whole contents of the log are more nearly utilized.

The larger diagram (5) shows the preliminary work. The two smaller ones, 6 and 7, show how the different parts are to be treated, the successive operations being described as follows:

First take off eight slabs, reducing the log to an



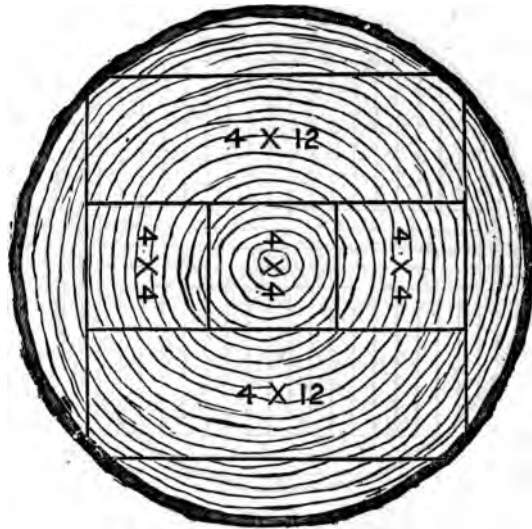
NO. 8.

octagon. Second, cut on the lines 1, 2, 3 and 4 in the order, given, leaving a heart piece, which may be 6x6, as shown in diagram 5, or 4x4. Third, cut the piece inch strips as shown in the diagram. Fourth, cut the piece A as shown in diagram 6. This piece, somewhat less than half the log, requires three turnings. Fifth, saw the parts B and C, which are alike in size and shape, as indicated by the lines in dia-

gram 7. It will be observed that the wedge shaped pieces may be converted into 2x4 or larger.

Quarter sawing yellow pine and norway pine for flooring is illustrated in diagram 8.

First square the log 8-inch heart face. Then saw lines 1, 2, 3, 4 and 5, after which rip up the cants A and B together. All the lumber inside the circle indi-



NO. 9.

cating the heart wood is near enough a true quarter sawing for flooring.

A modification of this design is shown in diagram 9, the only difference being that a square piece is left inclosing the heart.

There are other methods that may be employed by different sawyers, but those mentioned should be a

sufficient answer to the query made at the outset of this article.

Any wood can be quarter sawed if it is desired thereby to prevent shrinkage and warp, and that is the method employed when particular reliability is sought. But oak for finish, furniture and flooring and yellow pine for flooring are quarter sawed more than any other American woods. Edge grained for flooring is also extensively manufactured.

How to Pile Lumber.

How should lumber be piled?

The proper piling of lumber is an important consideration, for carelessness or ignorance in this department of the lumberman's business will result in an amount of broken, warped and twisted boards which will materially detract from if not entirely destroy their value. Where stock is to be air dried the piling is of special importance. It is necessary, of course, that the air should circulate above, below and around each board. In order that this circulation may be secured it is necessary to put strips between each layer of boards and to see that the edges of the boards do not touch. A little carelessness in placing these strips or in their size will result in the dry stock being wholly unsatisfactory. In the first place, to achieve satisfactory results, the piles should slope. This is easily accomplished by the supports which keep the bottom layer of boards off the ground being higher at one end of the pile than at the other, the intermediate supports being so graduated in height that the first layer of boards shall rest upon all without bending. If this is done rain water will not settle and cause rot as it is likely to do if the pile is level.

The base for the pile having been thus fixed, the strips which are placed between the boards should be exactly one above the other. If they are so arranged the weight of the boards being equal there will be no bending and consequent warping between those supports and the boards, when dry, will be perfectly straight. In the third place, these cross pieces should be as small as possible. The explanation for this is very simple. Where the boards come into contact with these cross pieces the air does not circulate and consequently the boards dry much more slowly, so that when the pile is supposed to be ready for the planer it will be found that the boards have not shrunk at the points of contact with the cross pieces and, therefore, are lumpy. When put through the planer these unshrunk places are reduced to the same width as the portion of the boards which are thoroughly dried. After dressing, however, these spaces shrink in the same proportion that the other material shrunk and the result is that at each place where the boards rested upon cross pieces they are thinner than elsewhere. If wide cross pieces are used this shrinkage is very noticeable and makes the stock unsatisfactory. If small cross pieces are used, say 2-inch strips, however, the shrinkage is hardly noticeable.

MACHINERY.

Sash or Mulay Saws.

When were sash or mulay saws first introduced?

About the beginning of the nineteenth century marked the change from the old pit saw to the sash or mulay saw. This was a great advance in lumber

manufacture. In the operation of a pit saw the top sawer stands on the log and guides the saw, while the pit man works under the log, the whole being a very slow and painful way of getting out a very little lumber. The output of the first power mills was exceedingly small, although the lumber probably was as good as that turned out today. They cut from 3,000 to 7,000 feet a day. In 1801 the population of the United States was 5,308,483, and its lumbering needs relatively were much smaller than are those of its ninety odd million inhabitants in 1906. In the country houses were built of logs, while in the city small wood and stone structures were used.

Band and Circular Mills Compared.

What are the comparative merits of the band saw and the circular?

As generally used now the band saw is conceded to be the more economical in the manufacture of large logs or of comparatively small logs of good quality. When the band saw was first introduced the main point claimed for it was that it was much thinner than the circular, consequently cut with a much narrower kerf and greatly lessened waste. An effort was made to cut the band saw down as thin as possible, but experience demonstrated that there was a limit to this, as the extremely thin steel did not possess the necessary rigidity to hold itself straight in the logs, the result being irregularly cut, lumpy lumber. It was necessary, therefore, to increase the thickness of the band saw. In large logs the band saw mill will cut more lumber in a given time than will a circular, but its operation is more expensive, as a higher class of labor will be necessary. In small logs a circular saw cuts more rapidly. As small logs do not make a very

good quality of lumber the amount wasted in cutting them with a circular saw, over that which would have followed the operation of the band saw, is more than made up by the increase in the daily cut and the decrease in the operating expenses. For these reasons in many of the best mills the band and the circular are operated side by side, the logs being allotted to band or circular with a view to economy in manufacture.

Shotgun Carriage Feed.

Who invented the saw carriage shotgun feed?

This appliance or application of an efficient agent, steam, in a direct manner, was perfected by DeWitt Clinton Prescott, of saw mill machinery fame, in 1874. The principle briefly may be described as hitching the piston direct to the carriage. Prior to the time when this idea was perfected and its workability demonstrated the mechanical problem was outlined in this fashion:

Problem, to move a log back and forth against a saw. The old way was a triumph of indirection. The boiler furnished steam to the engine cylinders; the piston rod transferred the power to the crank, which turned the wheel, which carried the belt, which drove the main shaft, that revolved a pulley, that carried another belt that drove another pulley, that drove a friction wheel which turned another friction, which turned a shaft that carried a pinion that meshed into a rack fastened to a carriage which carried the log. See the house that Jack Built, or the genealogies of the Hebrews. The log was sawed—sometimes—in spite of these arrangements having for their object its preservation intact. It got sawed provided the frictions did not get heated, some shaft did not

spring, or a belt slip or nothing was the matter with the engine. Mr. Prescott hitched the piston direct to the carriage, ignoring pulleys, shafts, belts, frictions, pinions and public skepticism.

Planing Mill Machinery Introduced in Michigan.

Who introduced planing mill machinery in Michigan?

Courtesy to the rival claimants prevents an unqualified answer. One of the first machines used of which an authentic record is available was a Woodworth planer, which was set up at Detroit, Mich., in 1846, by a man bearing the unusual name of Smith. He could not sell the product because people were accustomed to have their finish and flooring worked by the carpenters. The machine was bought by Samuel Pitts and afterward proved a money maker.

When Dowell Doors Were First Made.

When and by whom was the first dowell door made?

It is generally believed that John F. Lamb built the first dowell door in 1878 in South Africa. There were only two of these doors made at the time and the equipment of the factory by which they were turned out consisted of a saw, plane, brace and bit, a hammer and a jack knife.

End Matched Flooring Litigation.

What was the end matched flooring case, and how was it decided?

The idea of end matching flooring was conceived by a man connected with the T. Wilce Company, of Chicago, and was duly patented, the patent being granted January 1, 1895. Some time later, the popularity of this method of manufacturing flooring having been

established, the T. Wilce Company announced in several lumber trade publications that parties manufacturing end matched flooring would be prosecuted for infringement of patent. In accordance with this proclamation the Bush Temple of Music Company, of Chicago, was sued for infringement of patent and in this case the rights of the T. Wilce Company were sustained by United States Circuit Judge Seaman. Upon appeal the first decision was reversed.

First Flooring in United States.

Of what kind of lumber was the first flooring used in the United States manufactured, and where was it laid?

So far as known the first flooring was yellow pine, cut along the Delaware river in 1723 or 1724. It was worked into flooring an inch and a half thick and nearly two feet wide and laid in a stone house which was erected in 1724 at Bingman Ferry, Pa. In 1884 the old stone house, which had been partly dwelling and partly fort in the old days, was torn down and a new house built by Moses C. V. Shoemaker, whose ancestors had sawed out the old floor 160 years before. The floors in the old house were found to be in perfect condition, and although Mr. Shoemaker was offered an almost fabulous price for the great yellow pine boards, he had them relaid in his new residence, where apparently they will give good service for 160 years yet to come.

DRYING AND DRY KILNS.

Wants Treatise on Drying Lumber.

Can you refer me to a practical treatise on the drying of lumber both by air seasoning and by kiln?

Any dry kiln company can give this information.

Such concerns have gone thoroughly into the subject, having experts in their employ who devote their entire time and attention to its practical phases.

Dry Kilns as Fire Agents.

Is the dry kiln a dangerous fire agent?

Dry kilns are all more or less dangerous as starting points for a blaze; some are more so than others. The kilns may be divided into four classes, those operated by direct open fire, those operated by furnace, those operated by steam heat, natural draft and steam heat blower systems. Insurance companies appear to favor the natural draft kiln as being less liable to cause a fire. Next in order is the blower steam kiln, next the direct furnace heat kiln and last and most objectionable, from this standpoint, is the open fire—the smoke kiln.

How to Dry Cypress.

What is the best method to use in drying cypress?

Cypress manufacturers of long experience prefer to have their cypress dried in the open air. Several of the red cypress producers of Louisiana discard dry kilns altogether, some of them stoutly declaring that they would not have a kiln on their mill premises on any account. Others use both the air and kiln process—the latter when it is necessary to get out lumber in a limited time. It is a well known fact, however, that cypress is best dried when it is well piled in the open air, under a shed or roof if possible, and is allowed to remain there throughout an entire season. But the exigencies of trade are more and more making it desirable to hasten the drying process to some extent. Where there is time enough cypress can be

treated like the hardwoods, which are subjected to the air until they are "shipping dry," and afterward put through the kiln for perfect drying. Such has been the demand for cypress in recent years that shippers have been forced to forward partly dry lumber to satisfy the calls of urgent customers. Thus, much of the cypress going into distribution is partly dry, and there is a growing requirement for a process that will dry the lumber without impairing its quality for use. It has been found that too rapid drying is an injury to the wood.

Kiln Drying Cypress.

What is the best method of kiln drying cypress?

The practical drying of cypress, especially in more than 4-4 thicknesses green from the saw, has long been a problem to manufacturers. The great tendency of dry kilns to injure cypress boards in various ways, such as checking and warping, has discouraged a great many who have attempted to dry it by artificial means. It has also been found that the average kiln dried cypress is roughened, causing the grain to protrude, chip and break in dressing. Another common complaint of kiln dried cypress is its extremely spongy condition, tending to exceptional powers of absorption. This spongy condition results in the absorption of a vast amount of moisture when cypress is piled even in reasonably tight buildings after kiln drying, the lumber thereby becoming much more moist than ordinary air dried stuff. As stated, this applies more particularly to thick stock.

Careful experiments in both the north and south have traced all of these difficulties to one source; namely, too rapid drying. This means uneven drying



CASE HARDENED AND HONEYCOMBED OAK.

and is the result of too much atmospheric circulation in the kiln, or the application of too high a degree of heat, and usually both. Cypress could be quite well dried in boiling water were it not for the tendency of a boiling and steaming process to disintegrate the fiber, resulting in roughening and deadening the wood. Application of the natural moisture in cypress lumber has proved to be the only successful means of kiln drying it in various thicknesses. This is accomplished by moderate heat and extremely slow circulation, resulting in a high degree of humidity in the air inside the kiln. This humidity, which in fact almost reaches the point of precipitation, tends to keep a soft, flexible exterior, permitting the moisture to escape from the lumber under the pressure of moderate heat without checking, warping, casehardening or roughening the board.

Case Hardened and Honeycombed.

Please explain the cause of the peculiar checks in the piece of oak I send you. It was taken from a carload recently received. The general appearance of the lumber is good, but many pieces when sawed across the grain show checks as you see in this piece. It has been kiln dried, and I think it a little strange that none of the checks come through to the surface.

This is a case of hardening and honeycombing. The lumber was quite green when placed in the kiln and was at first subjected to too much heat. High temperature immediately contracted the wood on the surface and thus shut up the pores. This prevented the escape of the moisture on the inside of the piece, and extreme heat continued to generate steam or superheated moisture in the wood, and expansion and rupture of the fibers were the result. While the expansion on the inside of the piece was taking place the

case hardened outside remained intact and did not expand like the inside. The lumber should have been placed in a damp kiln and at first subjected to a temperature of about 100 degrees only, remaining thus until the moisture had been withdrawn. Then the temperature could have been gradually increased and the drying process completed without injury to the lumber. Thick oak is a difficult kind of lumber to dry. In no case should it be subjected to a high degree of heat when it is first placed in the kiln, for thus treated it is sure to honeycomb in the manner shown in this specimen.

CHEMISTRY.

Chemical Properties of Wood.

What are the chemical properties of wood obtainable by distillation?

Briefly stated they may be divided into four primary groups as follows:

1. Uncondensed gases which may be burned as fuel or, after certain treatment, used for illuminating purposes.
2. Tar, from which are derived benzol, naphthaline, paraffin, rosin, phenyl acid (creosote).
3. Pyroligneous acid (wood vinegar) from which are derived acetic acid, acetone and methyl or wood alcohol.
4. Charcoal.

Turpentine from Norway Stumps.

Has any successful process ever been perfected for extracting turpentine from norway stumps?

The turpentine plant located at Hineckley, Minn.,

promised great things at the start. It was put up to extract turpentine and tar products from old pine stumps. Many have formed the idea that the stumps are boiled, but this is wrong.

In May, 1903, the Standard Turpentine Manufacturing Company was organized, and located at Hinckley in June. The first extracting plant was built nine miles each of Hinckley, a location having mixed hardwood and norway growth. The first pair of retorts was put in operation in September and a small distilling plant was also put in for refining the crude turpentine until a permanent distillery could be built and put in operation at Hinckley.

The process (Russian) was destructive distillation. Retorts, installed in pairs, were made of boiler iron. These were encased in brick, there being a space between the retort and the casing. A furnace connected with the casing of each retort. The stumps were placed in the retorts in large iron baskets, which were manipulated by a derrick, each retort holding five baskets. When the retort was filled a cover was placed on and sealed. Heat then is applied and circulates between the casing and retort. As the heat increases the vapor from which the turpentine is made rises and is led off to a condenser. The tar products accumulate on the bottom of the retort and led off through pipes. After the turpentine and the products are all extracted extra heat is applied and the charcoal is finished off. As soon as the retort is cooled the derrick is again applied, the baskets raised and the charcoal dumped.

A local report on the operation states: The burning of the first pair of retorts proved the system and the enterprise an entire success. Three cords of nor-

way stumps were used, which cost the company \$65, this including \$3 a cord for stumps and \$1.25 a cord for five cords of refuse wood for fuel, such as settlers gather in clearing their land and which they otherwise would burn to get rid of it, and expense of all labor in operating the plant during the process of extraction. The results were as follows:

160 gallons refined turpentine at 60c.....	\$ 96.00
400 gallons tar products at 10c.....	40.00
300 bushels charcoal at 5c.....	15.00
Total	<u>\$151.00</u>

The above at wholesale prices at the factory. One pair of retorts has a capacity of sixty cords of stumps a month.

Cost of Operating Wood Chemical Plant.

What would be the first cost of operation and daily product of a fair sized plant for the production of wood chemicals?

All these processes, while differing in the methods of making and handling the wood, produce the same kind of pyroligneous liquor on condensing the smoke, and this liquor is the basis for manufacturing the chemicals. This crude liquor consists largely of water but contains also tar, acetic acid and wood alcohol. The first step is to let it settle in large tanks. Here nearly all the tar settles to the bottom. This is then drawn off and treated to produce tar oils for disinfectants and creosote, pitch and other compounds. The remaining liquor is distilled to separate all the tar. Then the acid it contains is neutralized with lime and the alcohol distilled off. The remaining solution is evaporated to dryness, when acetate of lime salt crystallizes out. This is dried and sacked and so sent to

market. The crude alcohol is redistilled and purified with acids, alkalies and other chemicals by a process too complicated to be described here and is then barreled and is ready for use.

As to the yields of these processes for each cord of wood it may be said that a product of fifty bushels of coal (that is, 1,000 pounds) may be considered good and forty-five bushels average practice. There is little difference of yield of charcoal by the different processes, but much difference according to the quality of the wood.

The yield of alcohol by the retort process is about twice as great as by the kiln process and the same may be said of acetate of lime. Good yield of alcohol by the retort process have been as high as eleven gallons of 82 percent and average yields are not over eight gallons of 95 percent alcohol a cord of wood. Corresponding yields of acetate run from 200 pounds to 220 pounds a cord. The kiln process has yielded four gallons of refined alcohol to the cord and frequent yields of three gallons are reported. One hundred pounds of acetate of lime are also yielded to the cord of wood.

The cost of a plant will vary greatly according to location and according to the character of the plant. In order to get an approximate estimate it will be necessary to make an assumption of prices of various materials, which is given below:

Hemlock or other building lumber at \$12 a thousand feet; red brick at \$7 a thousand; laying same at \$3 a thousand; firebrick at \$15 a thousand; the cost of horizontal retorts is now \$120 each at factory, but they have been sold for less than \$100 each.

Under these conditions the cost for retort house and

charcoal storage house would be about \$500 for each cord daily capacity, assuming a minimum of twelve cords daily. The chemical plant for producing refined alcohol and gray acetate of lime, including plant for treating tar, would cost as much more. Thus for a plant capable of treating twenty-five cords of wood daily the complete plant would cost \$25,000.

A kiln plant for kilns alone would cost \$150 for each cord daily capacity, and if only alcohol were produced, as is done in some plants, the chemical works could be built for as much more; but for a complete plant it would cost the same as for a retort plant.

The cost of operation is also quite variable, depending on the size of plant as well as on its location and the cost of labor in the locality.

The following figures from an actual works will give an idea of what can be done with a good modern plant well located. This plant is in the natural gas regions and has a daily capacity of thirty cords of wood. Its fuel is very cheap, being at the rate of about \$2 a ton of coal. It employs fifteen men at \$1.75 a day and a foreman at \$2.50. A statement of daily costs and yields is as follows:

<i>Daily products and value.</i>	<i>Daily cost of operation.</i>
6,000 lbs. acetate at \$1.10\$ 66.00	30 cords wood at \$3..\$ 90.00
1,500 bushels char- coal at 4c..... 60.00	Cost of fuel daily... 25.00
300 gallons crude al- cohol at 35c..... 105.00	Labor 28.75
	Lime and chemicals. 8.00
	Loading coal 9.00
	Loading acetate 1.50
	Interest and depreci- ation of 10.00
Tot. daily receipts..\$231.00	
Less daily costs..... 172.25	Daily cost, total..\$172.25
Daily profits.....\$ 58.75	
Profit each cord.... 1.96	

The profit here is apparently about \$2 a cord, but had refined alcohol been produced it would have been worth \$39 more a day and the expense of refining would not exceed \$9, leaving total profits of \$3 a cord.

A kiln plant is usually constructed with the object primarily of producing charcoal and the expense of attending the kiln plant is kept separate from the chemical works and the profits of the chemicals estimated separate from the charcoal.

A profit on chemicals at one small plant was equal to \$1 a cord of wood treated. At another large plant it was reported that the cost of producing alcohol was only 15 cents a gallon. This can only be done with a large plant under favorable circumstances.

From the foregoing it will be seen that a works of this kind demands the following requisites for economical working: First, wood for carbonizing and producing the chemicals; second, a supply of cheap fuel; third, a large supply of cooling water; fourth, facilities for transportation of the raw materials to the factory and of the products to market; fifth, a supply of lime. This is a subject which must be studied separately for each plant and unless experience is brought to bear it is probable that very costly mistakes will be made.

How Refuse May Be Utilized.

How may mill refuse be handled so as to get the greatest possible returns from it?

There are many uses to which mill refuse may be put, but the demand not always is sufficient to take care of the supply. Mill refuse consists of sawdust, edgings and slabs. Sawdust is used quite extensively for fuel at points of production and also has a more or less uncertain value as a covering for floors. With

modern fuel saving burners, the supply usually is in excess of the requirements of the mill. Slabs and edgings are used in the manufacture of pickets, lath and an almost infinite variety of small woodenware, matches, toothpicks etc., depending on the character of the wood cut. In recent years chemistry has come into play as an agency by which some of this waste material may be made to yield a profit through the production of gas, wood alcohol, acetic acid, creosote, tar, turpentine, coke etc. However, the market is not strong enough to take care of all the by-products it is possible to produce. Usually it is possible to sell locally a large part of the refuse for fuel.

To Secure Byproducts.

I understand in various parts of the country lumber manufacturers and others have installed plants for the purpose of extracting turpentine and other commodities from mill refuse, and would like to know the extent this industry has assumed and whether or not it has been found practicable and profitable to treat refuse in this manner.

Wood distillation is being taken up in various parts of the country where it is possible to secure raw supplies at minimum cost. This work has assumed an importance which perhaps is not realized by the general public. Interest in it is steadily increasing and a number of test plants have been established. In the pine districts of the north and south turpentine and tar refineries have been put up with a view of securing such products from mill refuse, stumps and the tops or limbs of trees which ordinarily are left in the forest to decay or cause destruction by fire.

Similar ventures also have been made in the fir districts of the Pacific coast, and it is claimed that it is possible to produce tar, tar oil, pitch, turpentine, pyro-

ligneous acid, charcoal and other substances. One of the most notable plants of this kind is that of the Pacific American Tar Company on Bellingham bay, which handles a large amount of mill waste with gratifying results. Among other products manufactured by the company not mentioned above is creosote, for which there is a big demand on the part of the timber preserving plants which heretofore has necessitated the importation of thousands of barrels of creosote into this country.

Various processes of wood distillation are being advocated and extolled and test plants are being put up with a view of ascertaining the practicability of the schemes. Details of the work are not given out by those who have them in charge and only the most meager information as to the results achieved are available.

Destructive Distillation.

What is meant by destructive distillation of woods?

The production of charcoal and of chemicals such as wood alcohol, acetate of lime and acetic acid is covered by this general term. There are two processes for the production of these wood products. The one which is generally used in the west consists of burning the wood in a kiln, thereby producing charcoal and the chemical treatment of the smoke for the separation therefrom of the alcohol, acetate of lime and acetic acid. In the east retorts are used, the chemical products being the chief objects of the operation and the carbon charcoal being treated simply as a by-product. All of these products could be obtained from any wood, but hardwoods are preferable, as they contain a greater amount of both charcoal and the desired chemicals. In 1899, 3,000 cords of wood a day were actually subjected to the process

of destructive distillation and since that time this amount has been very largely increased. In 1899 the value of exports of acetate of lime and wood alcohol was \$1,000,000.

Production of Ethyl Alcohol from Ton of Wood.

How much ethyl alcohol can be made from a ton of wood?

In 1903 a process known as the Classen system of distillation by fermentation was experimented with and the claim made that twenty-five gallons of absolute or fifty gallons of proof could be produced from a ton of wood—hardwood or softwood. Ordinary dry distillation is productive of only about four gallons a ton. The Classen process does not appear to have been pushed extensively and whether or not it was of practical value is uncertain.

Uses of Fir Oils and Soaps.

What are fir oils and fir soap and for what are they used?

Fir oil and fir soap are extensively used by gardeners and florists as insecticides. At present they are largely imported. An analysis of some of this fir oil showed that it was not the derivative of the balsam fir, as its name would imply, but of the destructive distillation of pine, being exactly similar to a product such as would be obtained from this treatment of long-leaf yellow pine.

How to Produce Wintergreen Oil.

How is wintergreen oil produced?

Wintergreen oil is supposed to be distilled from the leaves of the wintergreen shrub just as cider is supposed to be obtained from apples, whereas a great portion of it is distilled from pine shavings. Like-

wise a good deal of the wintergreen oil of commerce is distilled from the bark of the white birch. Just what proportion of the total product comes from the bush and what from the birch is not known. The operation of distilling wintergreen oil from birch bark is a simple one. The bark is put into a sheet iron lined box and water poured over it. Fire is built under the box and the vapor arising from the moistened bark passes through a coil of pipe, where it is so chilled that it is precipitated into the form of oil.

SHINGLES.

State of Largest Production.

What state produces the most shingles?

Washington is by far the largest shingle manufacturing state in the union. According to the census for 1899 the Chinook state turned out 4,337,992,000 shingles, its nearest competitor being Michigan with 1,926,110,000 shingles. The product of Washington was 36 percent of that of the entire United States. Practically all of the Washington shingles are red cedar, and of the total of 11,876,130,000 shingles produced in the United States in that year, 6,367,345,000, or nearly 54 percent, were cedar.

One Thousand in Board Measure.

How many shingles will 1,000 feet of lumber, board measure, make, the shingles to be same as standard cypress shingles, 4, 5 and 6 inches wide?

In a general way 1,000 feet of lumber is considered the equivalent of 10,000 shingles. A shingle is 4 inches wide and 16 or 18 inches long as the case may be. Lumber cut in inch or 2-inch thickness would make

very few shingles unless it was high grade stock. If the inquirer refers to the number of shingles that could be cut from logs which would cut 1,000 feet of lumber, it is difficult to answer. Everything depends upon the quality of the logs that are to be manufactured. Then the thickness of the shingles and the width of the saw kerf must be considered. A compromise estimate would place the shingle product of a thousand feet of logs from 8,000 to 11,000 shingles, but in some cases more than this number has been secured and in others the product has fallen below the minimum given.

Shingle Weavers.

What kind of men are shingle weavers?

An eminent scientist who recently spent considerable time in studying the condition of the shingle weavers and packers of the Pacific northwest has advanced the startling theory that they are a species of the genus homo. After an investigation which led this undaunted explorer into the native lair of the shingle packer and his boon friend and companion the weaver it is further claimed that they are susceptible to the same influences, that they are warmed by the same sun and wet by the same rain, as members of the human family.

Undoubtedly this investigator has shown great fortitude in penetrating this heretofore unexplored field and should be accorded honor second only to that rendered Darwin. The information which he has supplied the shingle manufacturing industry gives it a working capital and a secure foundation on which to build. The investigation was carried out at great personal inconvenience and the report is very thorough, the close observation of the explorer being sup-

plemented by microscopic examination of the individual specimen.

The correlation between the social status of a shingle weaver and the commercial status of the red shingle product is clearly indicated. It is irrefutably set forth that in order to improve the general character of the product the producer must be surrounded by uplifting influences. In taking up for consideration this report the influence of environment is clearly shown and it is demonstrated to the satisfaction of the investigator that so long as the personal comfort and welfare of the shingle packer continue to be neglected so long will he continue to turn out slovenly packed shingles. The remedy suggested is to begin the improvement at the fountain head—to elevate the shingle packer, which will remove all causes for imperfection and stimulate him with an earnest desire to attain the highest ideals in social life and consequently carry them out in his everyday work.

First Mill on Vancouver Island.

When was the first shingle mill started on Vancouver Island?

What generally is conceded to have been the first was put up and began operations in February, 1892, by W. E. Loser. Whether or not he lost cannot be said.

World's Record of Shingle Manufacture.

What is the world's record for shingle manufacture?

The Sobey Manufacturing Company, of Getchell, Wash., broke the world's record for manufacturing shingles July 1, 1904, when in ten hours it made 310,000 "5 to 2" clears and 4,000 choice A's. The work was done on a Challoner double block machine which

was kept running from 170 to 180 clips a minute.¹ The shingles were all well manufactured.

Best Nails.

Is it a fact that wire shingles will not hold nails as well as cut nails, and, if so, why?

Every wood contains acids of varying strength and intensity. The difference in the effect of the acid on wire and cut nails is due to the character of the iron entering into the construction of the above nails. Without an attempt to use scientific terms or describe the matter in a technical way, the iron used in making wire nails is more nearly carbonized than that used in making cut nails—in other words, the iron in cut nails is of purer quality than that of wire nails.

Meaning of 5 to 2—6 to 2.

What are the meanings of the terms "5 to 2" and "6 to 2" as applied to shingles?

These terms relate to the thickness of the shingles at the butt. Under the former is meant shingles which would run five to two inches and the latter, shingles which would require six to make two inches.

First Machine Made Shingles in Michigan.

When and by whom were the first machine made shingles produced in Michigan?

Joel W. Kelsey, one of Michigan's pioneer lumbermen, is credited with having sawed, jointed and packed the first 100,000 sawed shingles turned out in Michigan. Mr. Kelsey was a native of Maine who moved to Michigan in 1840 or thereabout and in connection with an elder brother engaged in the manufacture of lumber. At that time shingles were all hand made. People

did not believe it possible to make shingles with machinery and the Kelsey product was marketed with difficulty. Now, this prejudice seems absurd. At the time it was thought to be well founded, and perhaps had a better foundation than now seems probable. Hand shaved shingles, when honestly made, lasted a great deal longer than those turned out by machinery.

Red Cedar Dimension Shingles.

Can you put us in communication with some mill concerning manufacturing red cedar dimension shingles that grades them "Prime," "Best" etc.? We understand there is a mill operating on the coast that makes dimension shingles and sells them at the same price as Extra "A".

There are a number of cedar shingle manufacturers on the coast who make a specialty of dimension shingles with both plain and fancy butts. As to the price at which such products are sold or, for that matter, as to the price of any red cedar shingles the editor does not consider it within his province to establish a basis. In fact, so far all efforts in that direction have failed.

Longest Service by Shingle Roof.

What is the life of the ordinary shingle roof?

This is a question which is not determined by the kind of wood used in making the shingle so much as it is by the thickness of the shingles and even more than this by the kind of nails used in fastening them in place. Extremely thin shingles are often broken by being walked over or even by the blows of a heavy hail storm. The principal destructive element of the modern shingle, however, is the wire nail. These nails rust and the heads come off after which any heavy wind is likely to rip some of the shingles from their places, causing a leak. In early days when thick shingles and

iron cut nails were used a roof would last twenty or thirty years and in many cases even longer periods, but at present repairs usually have to be made within seven or eight years from the date of laying the shingles and it is the exception when a new roof does not have to be put on after fifteen years.

Life of Shingle Roof,

What is the longest known period of the survival of a shingled roof?

It is a matter of history that Daniel Burt built a house in 1764 which he roofed with rived white oak shingles held in place by hand forged iron nails. This roof remained in place 138 years and when removed is said to have been in fairly good condition. The shingles probably were very thick, but the principal factor in their survival of the storms of so many years probably was the iron ails with which they were fastened. Had they been secured with the modern steel wire nail they probably would not have lasted more than fifteen years at the outside.

Redwood and Red Cedar Shingles.

Some dealers here are selling the Washington and Oregon red cedar shingles for redwood. Please settle the difference between the red cedar of the north coast and the redwood of California. I handle both varieties.

It is easy enough to settle the difference between red cedar shingles and redwood shingles by looking at them in the bunch. Though redwood is a species of cedar, it is quite dissimilar from red cedar. The latter is a somewhat lighter wood, is of a more brash and brittle grain, and is lighter of weight than redwood. A peculiarity of redwood is that it has a hard layer between the annular growths, the interspaces being compara-

tively soft. When dressed, redwood has a deeper, darker red color than cedar, which grows richer by age, like mahogany. The botanical name of redwood is *sequoia sempervirens*, while that of red cedar is *thuja plicata*. Redwood grows in California and red cedar in Washington, Oregon, British Columbia and Idaho. One might as well sell white cedar for southern cypress as red cedar for redwood.

Red Cedar Specifications.

We have a lien case in court which may hinge on the sappiness of 5-2 Extra Clear red cedar shingles. A few of the bunches have a little sap on the edges of some of the shingles, which we contend is not more than usual or customary in baling 5-2 Clears. The other party contends that there should be no sap at all on the edges. If there is any set of rules for grading red cedar shingles will you please forward us one by return mail?

Red cedar shingles are the most unsatisfactory item which the lumberman is called upon to handle. Absence of any strong association on the coast makes it possible for each manufacturer to adopt a system of grading and inspection for himself. The more responsible producers as a rule turn out a first class article which can be depended upon and which invariably gives good results. Some of the less progressive shingle makers seemingly are content with anything that will pass muster, and there is no question but that at times they allow their employees to grow careless in manufacturing and packing shingles. While from time to time a number of systems of inspection or rules for grading have been adopted by various bodies no uniform rules exist and their absence causes dissatisfaction among consumers.

On January 17, 1901, the following rules were adopted by one organization as the standard:

Eureka—18-inch, random widths, five butts must measure 2 1-16 inches in thickness when green or two inches after drying; must be well manufactured, strictly clear in every respect and 90 percent vertical grain. Will not admit any shingles narrower than two inches.

Extra Clear—Sixteen inches, random widths, five butts must measure 2 1-16 inches in thickness or two inches after drying; must be well manufactured, strictly clear in every respect and 90 percent vertical grain. Will not admit any shingles narrower than two inches.

Extra *A*—Sixteen inches, random widths, six butts must measure 2 1-16 inches green or two inches after drying; must be well manufactured. Will admit sound knots ten inches from butt; otherwise must be strictly clear and 90 percent vertical grain. Will not admit of any shingles narrower than two inches.

There can be no question but that should a uniform standard for the manufacture of red cedar shingles be adopted those engaged in the industry would be benefited. As a matter of fact, however, and as intimated, the larger manufacturers endeavor to produce a shingle which corresponds very nearly to the specifications given and which for all practical purposes may be regarded as the standard, although it is not always strictly observed. Should the quality of shingles furnished by any producer be questioned it probably would be difficult to show that they were not of the grade for which they were sold, and while they might not be equal in quality to the product of other mills it would be possible for them to correspond in quality to those formerly furnished by the same manufacturer and which had been accepted and used without question.

This does not clear the matter up to any great extent, but where an industry is so complicated and is conducted on such an unsatisfactory basis as is the manufacture of red cedar shingles there is no known

means whereby a newspaper can straighten out the tangle.

This comment was made before the organization of the Shingle Mills Bureau, of Seattle, which now controls 80 percent of the shingle output of Washington.

Advantage of Shaved Shingles.

What is the advantage of the shaved shingle over the sawed?

It is claimed that the last strokes of the draw close the grain and prevent moisture from entering and rotting the shingles as it does in the sawed shingle where the grain is left rough and open. There is a big difference in the price of the two products and even if it were desirable to use the shaved shingle it would be impossible to get enough men to work out the 12,000,000,000 or 13,000,000,000 which annually are used in the United States.

Inter-State Shingle Company of Washington.

Will you give me a brief outline of the history of the Inter-State Shingle Company of Washington?

This concern was organized in 1903 with a view to handling the entire shingle industry of the state. Prior to its organization leaders in the shingle trade had been striving for years to bring about a better condition. For many years the industry was not considered a profitable one, prices ranging from \$1.50 for star grade to \$1.80 for clear. The company figured on handling 75 to 80 percent of the entire product of the state. Internal dissension and opposition from the outside resulted in its disruption.

Washington produces more shingles than any other

state in the Union and has more shingle mills than any competing state. It is estimated that the shingle mills use about 600,000,000 to 700,000,000 feet of merchantable timber each year. In 1903-4 it was estimated that the conversion of this timber into shingles resulted in a loss to operators of between \$3,000,000 and \$4,000,000 as compared with what would have been received had the timber been cut into lumber. The statistician evidently did not take into account the difference between the quality of the logs used in the manufacture of shingles and lumber.

Breasted Shingles.

What is the distinction between sawed and breasted shingles?

Breasted is another name for dressed. A breasted shingle is smooth, as though planed. It is also known as shaved. Breasted or shaved shingles usually are made of white pine, the standard dimensions being 18 inches in length, $\frac{1}{2}$ inch in thickness at the butt and $\frac{1}{8}$ -inch at the point. They are or should be manufactured with square ends and square points and not less than 4 inches in width, although an occasional 3-inch shingle is not objectionable. They are usually packed in bunches of 500. The best breasted shingles are made from split quartered white pine, although quartering with a saw is not infrequent. They should be sawed with and not across the grain. Eighteen-inch shingles are sawed $\frac{1}{2}$ -inch at the butt, $\frac{1}{8}$ -inch at the point.

The above dimensions are the general standard, although, of course, variations are made which are recognized as being regular. In the south shingles run thicker and some are cut 24 inches long.

Yellow Pine Shingles.

Do you know of any concerns manufacturing yellow pine shingles which kiln dry and creosote their sap shingles? Also, what is the yellow pine shingle product of the United States?

No. The manufacture of yellow pine shingles is confined largely to the south Atlantic and Gulf coast states. In 1899 the total production of yellow pine shingles was 936,611,000, the greatest contribution to the total being made by the states given here:

Alabama	111,234,000	North Carolina...	118,850,000
Georgia	221,991,000	South Carolina...	54,033,000
Louisiana	49,165,000	Texas	186,376,000
Mississippi	17,417,000	Virginia	18,232,000
Arkansas	35,226,000	Florida	50,426,000

While no positive grounds exist on which to base the statement, it would seem from the increased use of other kinds of woods for shingles that the employment of yellow pine for that purpose has probably not increased to any great extent during the last five years, though this is merely a conjecture.

**First Shingles Produced in Humboldt County,
California.**

Who made the shingles used to cover the buildings at Fort Humboldt, and how were they produced?

On December 29, 1852, Colonel Buchanan landed at Eureka with his regiment and on the first day of January, 1853, the troops were drawn up on the site of Fort Humboldt, where the first flag was raised, Sergeant Joseph Snedden, corporal of the squad, having that ceremony in charge.

The first provision to be made was suitable quarters for the men and officers, and the sergeant who had been instrumental in flinging the Stars and Stripes to

the breeze was ordered to take six men, go back into the great redwood forests in close proximity to the fort and make shingles with which to cover the buildings. These men were amateurs when it came to making shingles. Snedden had been apprenticed to a cooper in his youth, knew how to shave barrel staves and applied such knowledge to the manufacture of shingles. He had a bench made and shaved all of the shingles used.

His work evidently was of a high class, for the shingles are in many respects perfect today, having withstood the heavy, sand laden winds from the sea for half a century. On the remaining building, once the quarters of army officers, are to be seen a large number of the product of Sergeant Snedden's skill. The building itself, however, is being undermined, the windows and doors have disappeared and it is rapidly disintegrating. Most of the timbers composing the structures bear evidence of the wearing hand of time but the material itself is sound and with suitable care the missing parts could be replaced and the house again made habitable.

Only two of the buildings used by the government troops during their occupancy of Fort Humboldt are now standing, and of these one is rapidly being beaten to pieces by the winds from the sea. The other is in a fair state of preservation and is being used as a storage house by a dairyman. This was the commissary building.

PART VI.—LUMBER.

USES OF WOODS.

Heart Wood for Outside Purposes.

In selecting lumber which is to be exposed to the weather should sap wood or heart wood be chosen?

The sap wood of very few varieties of timber will last any length of time if exposed to the weather. Heart wood usually is preferable.

Uses of Persimmon.

Can you tell us for what purposes persimmon wood is used? We are cutting some persimmon logs and are looking for customers.

Persimmon is used for shoe lasts, shuttles and for various other purposes of a similar nature. It would be well for the manufacturer to get in touch with consumers of these lines and if the wood is properly cut he should be able to find buyers.

Uses of Tupelo.

Of late much has been heard about tupelo gum. Can you give me an idea of the purpose for which tupelo lumber is adapted?

Tupelo is now used extensively for house flooring and inside finishing, such as moldings, door jambs and casings. A good deal of tupelo lumber finds a market in European countries, where it is highly valued for different classes of manufacture. Of these countries

England furnishes the best market and the greatest demand for square timber. There is also a good demand in England for the clear and upper grades of interior finish and flooring.

Much tupelo, especially of the lower grades, is used in the manufacture of boxes, since the wood works well upon rotary veneer machines. There is also an increasing demand for tupelo for lath, wooden pumps, violin and organ sounding boards, coffin manufacture, mantel work, conduits and novelties. It is used in the furniture trade for backing, drawers and panels.

In the mill yards tupelo has almost entirely replaced cypress and pine for use in tramways. The latter woods will sliver up and wear out in a few years from the heavy traffic of the lumber trucks and roughshod mules, but tupelo laid for eight years shows no sign of decay and very little wear. The appearance of the wood when used for tramways indicates that it will make excellent flooring for depots, warehouses, and other places subjected to heavy traffic. Tupelo has also replaced cypress for sill work in the lumber trucks which are used on the tramways and which carry loads of lumber weighing from 6,000 to 7,000 pounds.

Birch for Hubs.

What material is used for wagon hubs and how is it treated?

For the heavier class of wagons, birch is used almost universally; in fact, red or black birch is generally considered the only proper wood for the manufacture of high class hubs. However, sometimes hubs are made from yellow birch. As a rule hubs are manufactured as a special industry and are sold to the wagon makers. The hub manufacturers buy the logs,

bolt them and turn them into hubs. When this has been accomplished the hubs are put into hot water and steamed and afterward soaked in oil to prevent them from checking. The operation has the additional effect of loosening up all the coloring matter in the wood, with the result that it is difficult to tell heart wood from sap wood or yellow birch from black or red.

Lumber Used for Fruit Packages.

Can you give me an idea of the quantity of lumber used annually for packages in California?

One of the heaviest demands comes from the raisin field in the central southern part of the state. Recently an estimate of the quantity used was made. It requires about 20,000,000 feet to handle a 5,000-car crop.

In addition to the demand for material in which to ship the raisin crop it requires a considerable amount of lumber properly to conduct a vineyard. It takes about 2,500 feet for each acre for trays and for boxes for picking and shipping. There are in Fresno county in the neighborhood of 70,000 acres in vineyards, and on this basis it would require 177,500,000 feet of lumber to equip the vineyards. The life of the raisin trays and picking boxes is only seven years.

The demand for boxes for fruit packing purposes in California is perhaps the greatest for that industry in any state in the Union. In 1902 over 100,000,000 feet of lumber was used in making fruit boxes, and about one-fifth of this amount was used in the San Joaquin valley.

In the orange box trade 362 boxes of standard size can be loaded in one car, and each box represents between five and six feet of lumber. Figuring on this

basis about 8,000,000 boxes were used, containing probably 50,000,000 feet of lumber. Most of the orange and lemon boxes are made of pine, but lately there has been some spruce from the north employed for this purpose. The material used in the orange boxes must be first class, though small knots are allowed. This immense amount of lumber is used but once. After serving its purpose as a package for the fruits of California the best disposition which can be made of it afterward is for kindling in the large cities.

Walnut for Furniture.

When did walnut lumber first become popular as a furniture wood?

The year 1848 was the first in which walnut was used extensively for the manufacture of high grade furniture. The supply first came from Ohio, but as the resources of that state became depleted woods operations were transferred to Indiana. At present walnut is exceedingly scarce. Mills are no longer located in the timber but at some central point to which is shipped such timber as can be obtained in the state or from adjoining states.

Painting Yellow Pine.

How should yellow pine used for outside finish and siding be painted so as to secure the best results?

The first thing is thoroughly to dry lumber in the open air—in the summer, not in the winter—for three months. Yellow pine, like any other wood, will take and hold paint much better when thoroughly dry. Many a poor job of painting can be attributed to the fact that the lumber was not dry.

In the second place the object is to counteract the

damaging effect of the pitch when mingled with the paint. This can measurably be done, making a thin priming coat by using three pints of turpentine to three pints of unboiled linseed oil to mix one gallon of paint, and using the best paint obtainable. After this primer has been well applied, spread on a second coat of a color that will completely cover the wood. Do not put on a third coat at first, but allow the building to stand with two coats while it looks fairly presentable. The time will come when the building will need repainting, which can be done as in ordinary cases, though raw linseed oil and good paint should be used in every instance where satisfactory work is sought.

Especial emphasis should be placed on the necessity of the turpentine and the thin filler as the foundation for an even, reliable job of painting on yellow pine. The turpentine cuts and neutralizes the pitch, and prevents it from mingling with the oil in such a manner as to keep it perpetually green. What is wanted is a hardening process, and the turpentine with the oil making a thin coat seems to effect the desired result.

Match Stock and How Handled.

In recent correspondence I have noticed that mention is often made of buyers visiting different markets in quest of match stock. Will you kindly advise me what the character of this stock is and the manner in which it is cut into the small bits of wood used for making matches?

Match material is usually picked from D select. Sometimes the buyer purchases a quantity of the stock graded according to accepted inspection rules for white pine lumber—white pine being the best and easiest worked match stock lumber that has ever been secured. Of late years, however, buyers have visited

the big wholesale and manufacturing centers and have picked out from the ordinary run the kind of lumber they want. In doing this they endeavor to secure material that will run 60 to 70 percent straight grain. Knots and other defects are not particularly objectionable if the specified amount of the material can be cut into 2 and 3 inch blocks and the grain runs absolutely straight to any given base. Not only must it be parallel to the side or end but also to the top and bottom, in order that the stock after it has been finished will not be cross grain—that is, the grain must not dip. In making match sticks the lumber is cut into blocks of a prescribed length, the stock steamed and then run through the special machine used in turning out match sticks.

Wood as Pavement.

Does wood make a durable pavement?

At one time cedar block pavement was considered one of if not the best paving material that could be secured in this country, but its use is rapidly dying out, in the cities at any rate. This probably is due to the fact that the wooden pavements were improperly laid rather than to the fact that the material was not suitable for the purpose. While advances have been made in the science of laying stone and manufactured paving materials, the great bulk of the wooden blocks have been laid in a sort of haphazard manner upon an insecure foundation, or in many cases upon none at all. The result, of course, has been that the comparisons have been to the disadvantage of wooden pavements. There are examples of wooden pavements, however, laid with the same care as is exercised in the laying of granite, asphalt and concrete, which prove that

if properly treated any fillable wood of lasting quality, such as cedar, shortleaf or longleaf yellow pine, cypress etc., will give as good service as will any of the other paving materials in use.

Many factors are to be considered in connection with the subject of paving. If expected to endure the wear incident to heavy teaming the pavement, of course, should be composed of such material as will not readily cut up. If for light driving, one of the chief requisites is resiliency, to which durability, in a measure, may be sacrificed. To be satisfactory it is necessary that a pavement should be as nearly noiseless as possible, and another important consideration is that it should be sanitary—that it should not permit of the soaking in of any unsanitary matter—and should permit of being readily washed either by sprinklers or by natural precipitation.

Properly laid blocks combine these desirable qualities in large measure. In the first place a foundation should be prepared for their reception. This foundation should be preferably of concrete or some other material which will give equal durability. The blocks should be thoroughly creosoted, about ten pounds of creosote being used to the cubic foot. The blocks should then be carefully laid in the prepared foundation with the ends of the grain up. The resultant pavement possesses the features mentioned above, although for heavy trucking it probably will not compare with such material as granite. It is clean, practically noiseless and possesses a greater degree of resiliency than any of the stone or composition pavements. The cost of such treatment, however, is considerable and brings the pavement well up to the most expensive of the other pavements used.

Care of Maple Flooring.

How should maple flooring be handled by retailer and user?

Presuming that a millman has thoroughly dried his lumber until it has reached the limit of contraction and then allowed it to expand under normal conditions, that the work of its manufacture and polishing has been well done, that it has been put into a dry, well ventilated warehouse and that it has been loaded into tight box cars, there still remains a great deal to be done if thoroughly satisfactory results are to be obtained by the consumer. The consignee must pick out a dry day to unload the car. He should pile it in a closed shed or, if it is put into a house, it should not go into one that is newly plastered or that is not thoroughly dry. After being laid it should be well filled and polished at regular intervals.

Cypress for Fence Posts.

What is the lasting quality of cypress when used for fence posts?

Cypress is used for railroad ties, bridge timbers, telegraph poles and for the construction of greenhouses, water tanks and in other ways which bring it into contact with moisture and those germs of decay which cause most woods to disintegrate. It has proven itself of great value for the purposes specified and is preferred over other woods as a tie material by the southern railroads for use in boggy sections, being said to withstand better than treated woods the moisture and strain. It has been used for fence posts by the railroads and general trade as far north as St. Louis and its lasting qualities have been given a fair test. In the construction of a deer park in St. Louis county for a St. Louis banker, it was intended to use Tennessee red cedar,

but this stock could not be obtained and cypress was substituted in part. The park was built about seven or eight years ago and the cypress posts used are said to be in excellent condition, showing its lasting qualities are apparently equivalent to those of red cedar.

Soap and Water on Maple Flooring.

Will scrubbing with soap and water hurt a maple floor?

Frequently scrubbing of a maple floor as it is done by the ordinary scrubwoman very soon will rot the wood. Where the floor has been treated to a filler and a finish put on it, however, a little water will not hurt it, if properly used. In fact, when the finish shows signs of wear and needs renewing the floor should be cleaned well with soap and warm water and then a light coat of liquid granite applied and afterward a hard rubbing with pumice stone and oil. Care should be taken, however, to remove all traces of the oil afterward.

Longevity of Cypress.

What records are there of the enduring quality of cypress?

It is stated that the gates of St. Peter's, at Rome, were of cypress and that when they were removed by Pope Eugene to be replaced by brass gates they were over 1,000 years old and still were in good condition. History credits Plato with having had his code of laws engraved upon cypress, preferring that wood to grass on account of its longevity. The bible mentions cypress as being the wood from which idols were carved. Herodotus records the making of mummy

cases from cypress by the Egyptians and Pliny states that the statue of Jupiter in the capitol of Rome was built of cypress and had existed 600 years without showing the slightest signs of decay. The same historian asserts that the doors of the temple of Diana, at Ephesus, were of cypress and although 400 years old at the time he wrote looked to be quite new. In the days of the Roman empire cypress wood was considered so valuable that tracts of it were given as marriage dowers, a circumstance which led to the wood being called *dosfilea*. The record of cypress exists from prehistoric times to the present day without a serious break. In the middle ages Leo Alberti mentions finding some cypress which had been part of a vessel bearing a record that proved it to have been submerged 1,300 years. The wood was in good condition. In the later 80s a cypress coffin was found in St. Michael's church, Charleston, bearing the date 1678. The wood was sound throughout, but the bones which it once had enclosed had long since turned to dust.

Cypress for Hothouse Construction.

What is the best wood to be put into a hothouse?

Of late years cypress has come into general use in hothouse construction. It is superior to many other woods in its resistance to heat and moisture. Hothouses are kept at high temperature. The necessity for continually watering the plants makes this a moist heat, the most trying to which any wood can be subjected. Years ago white pine was used for hothouse construction, but cypress now is employed almost exclusively, as it will last much longer than will any other lumber so far experimented with.

Woods Used for Furniture.

What are the principal woods used in this country for furniture?

Oak and mahogany are the predominating woods. Oak takes a wider range in manufacture than any other, being devoted to high class, costly goods, and ranging downward through all grades of the middle class and finally dropping to the cheap stuff, which includes a large part of the output.

At the January, 1906, exposition in Chicago lines of goods from 442 manufacturers were shown, and they came from practically every state in the Union in which furniture manufacture is carried on to any extent. It is a noteworthy fact that in the majority of these 442 lines oak was the dominating wood.

This prevalence of oak in furniture manufacture is the result of several potent causes. As a comprehensive proposition it can be said that oak is the most available cabinet wood in America. It is so because it is obtainable in the most copious supply; it is best adapted to the manufacture of furniture and fixtures of all grades; the supply of oak lumber has lasted since the settlement of the country, and will last yet many years, so that oak as a cabinet resource has had a permanent basis, and the quality of the wood is reliable and satisfactory. All these considerations have made the dominance of oak for furniture purposes inevitable.

In the finer work of the manufacturer mahogany holds a unique and unassailable place. Within a few years it has come to the front in a larger use than theretofore. It is no longer devoted exclusively to the very highest grade of furniture but is employed in a wider range of goods than formerly. In fact, it is the principal rival of oak in the better classes of

suites for the chamber, the dining room, the parlor and the variety of extras and novelties that are turned out as temptations to the house furnisher.

Such is the high art employed in the finishing of both oak and mahogany that it is hard for one to tell which is the more excellent of the two woods. It can be conceived, however, that the time may come when oak shall have become so nearly exhausted and prices thereof so high that veneered mahogany and other tropical woods will become the main dependence for good furniture and for all cabinet finish.

Quarter sawed oak is the only form of that product that can be said to enter into high grade furniture manufacture, and it must be white oak at that. Quarter sawed red oak is much used, but it is of a grade at least one degree below white oak, though handsome effects can be secured by a judicious use of quartered red oak. It should be remarked, likewise, that the red oak of Michigan and Wisconsin is somewhat different from the oak called by that name originating in the south. By taking all kinds of oak, the great advantage held by the wood is its adaptability to a wide range of furniture that the mass of people want and can afford to buy. Oak is also the main dependence in desk and office fixture manufacture, though some fine goods for such lines are turned out in mahogany.

Next to oak and mahogany comes birch. In one sense birch may be said to be more prominent as a furniture wood than mahogany, because it is used as an imitation of mahogany, or to give mahogany effects in classes of furniture that must be sold cheaper than mahogany. The preponderating amount of birch is finished to look like mahogany. But some very fine

work is done with curly birch, which is finished in the natural. All plain grained birch is given the mahogany effect. Birch is altogether an important furniture wood. It finishes well and occupies a large place in the lines of manufacturers. It is known, however, that the supply of birch is rapidly diminishing, and the time is not far distant when the supply in the United States will be so nearly exhausted that it will cease to be an available wood for large lines of furniture manufacture. Then it will be like black walnut and cherry—discarded because there will not be enough of it to make it available for extensive lines of furniture.

This leads to an observation on walnut and cherry. There were a few suites and pieces done in walnut at the Chicago show, some in foreign burls and some in domestic wood. No attempt was made to put out extensive lines, and such work in walnut as has lately been done has been in the nature of a rarity. Yet walnut is just as handsome and dignified as it ever was, and holds its character as the peerless furniture wood. But, alas, it is one of the "has been's," and never again can take a foremost place in the cabinet line. As for cherry, it is about obsolete. It is sought by nobody for extensive lines, and is a negligible quantity among the furniture woods.

Scattered among other lines of fine furniture one will see sets and special pieces of birdseye maple. Evidently, all of such wood obtainable is used. As a unique specialty no wood in existence is more pleasing to the eye. It would scarcely do for general use, because it is too light, dainty and fine—a fanciful thing in the nature of the ornamental. But there is not enough birdseye maple to menace its own standing

by over profuseness. While the wood can be obtained there will be a place for it at high prices.

Furniture men frequently refer to the base woods. In this class they include white and black ash, elm, basswood, and some others. But the base woods are much employed in furniture making. There are factories that turn out lines of chamber sets, dining room outfits and other lines in elm—hard elm at that. Soft elm was once much used in parlor frames, but its scarcity now precludes its extensive use. Basswood and poplar will do for kitchen tables, and for backing and drawers it is a main dependence. All sorts of base woods are employed in the out-of-sight parts of furniture, not only in the cheaper but in the medium class and very good makes.

Market for Magnolia.

Is there any market for high class magnolia?

Magnolia is a small part of the general hardwood supply, although more of it is produced in the south than many are aware. It is a high class hardwood and can be used in manufacturing high grade goods such as pianos etc. Manufacturers of such articles should be interested in this wood.

Market for Gum Veneer.

What market, if any, is there for gum veneer?

According to a compilation issued by the Government Forest Service, 20 percent of the veneers cut in 1905 was gum, indicating a general use by those who employ veneers in their work. Furniture, interior finish, sewing machines and similar articles are being made of composition boards of which the cheaper woods form the core and a high grade veneer of oak,

mahogany, maple or some other equally desirable finish is added. Much of this built-up wood is being made of gum, some being cut on rotary machines, some by saws and a part by knives.

Use of Maple for Lumber.

How long has maple been used as an article of lumber commerce?

Twenty years ago hard maple was considered fit for nothing better than firewood, but about that time it was discovered that even the green wood had great strength and extreme durability in resistance to abrasion. Its manufacture into furniture and house finish then began, the bird's-eye or burl maple being the most favored. About five years later maple began to be manufactured into flooring, but the flooring machines then in use were not heavy enough to turn out good work on this hard material and it was not until several years later that machines were built which enabled flooring manufacturers to turn out acceptable maple products. When this was accomplished, however, maple flooring grew rapidly in favor and now leads all other woods as a flooring material. About 250,000,000 feet a year is used for this purpose.

End Matching of Beveled Siding.

Can you give us any information as to whether poplar bevel siding could be end matched or not? It seems to us that it would be possible to end match poplar bevel siding the same as flooring. Do you know if there has ever been any experiment in regard to this? We would thank you very much for any information you could give us in regard to this matter and also for your opinion in regard to the same.

There is no good reason why poplar bevel siding or

bevel siding from any other wood could not be end matched. Under the decision of the United States Court of Appeals for the seventh circuit, end matching can be utilized without the payment of royalty. In the long lengths in which siding is usually placed upon the market end matching would not prove of very much utility, inasmuch as so considerable a portion of it is cut up into short lengths in fitting about windows and other openings. Odd and short lengths of siding might be made items of regular stock, thus effecting no inconsiderable economy, and the end matching of bevel siding might then prove of considerable value. It would then be possible to make a good joint between studding. This process of manufacture would surely make a more nearly air and weather proof joint than does butting the ends together. It would seem that the end matching of patent siding would be fully as valuable as the end matching of bevel siding.

Piano Key Stock.

Users of basswood make contracts for what they call "key stock," and when they get on the pile they select and take nothing but absolutely clear, straight grained white lumber. We have been sorting out our white basswood for the last three years and the results we have obtained have convinced us that the white basswood business is a delusion and a snare. Hereafter we shall put up our basswood stock in the regular way, and if the key stock men want any from us they can buy the log run and select what will suit them on their own yards.

The writer of the above is not the only hardwood lumberman who is inclined to eschew the "key stock" purveyorship. There are others, and some of them do business in Chicago. But—it depends on how it is done. A good deal of ingenuity can be practiced in sorting out and putting up white basswood for key boards. What

the manufacturers want is 1¼-inch stuff, with a large percentage of clear, straight lumber in it, and they want it white. The grade name cuts less figure than the available percentage for their purpose. It must cut well into keys, which are covered with ivory, as every one knows. If a seller does not know the difference a buyer can successfully insist on all firsts and seconds, but lots of "key stock" would grade only as No. 1 common. Lumber of the requisite width, out of which will be cut only a limited amount of defects, leaving a good percentage of straight grained clear stuff, is acceptable to buyers when the seller knows his business. We should not be surprised if skillful manipulators could work in some pretty low grade stuff by a little ingenious cutting. What the saw mill man or the dealer who handles stock at first hand needs to do is to study up what is wanted by the piano and organ factories and put it up to suit the case. He can then make a price on it that will pay for the manipulation. Lots of money is made out of lumber so handled in other lines than key stock. The manufacturer can refuse to sell key stock as a separate kind of goods if he so choose, or he can study more carefully the wants of the market and pit his knowledge and skill against the exacting demands of buyers.

Match Stock.

What is the extent of the match industry in the United States as it affects the lumber industry?

In 1900 it was estimated that 150,000 feet of lumber was cut up into matches every day. Figuring on the basis of twenty-six working days in the month, this will give an annual consumption of 202,800,000 feet. Besides this, considerable stock was used in the making of match boxes. The industry has increased in

size materially since the date given but no accurate data is at hand to show just what the increase has been. There has been a great change in the kind of lumber used for this class of manufacturing. Twenty-five years ago the choicest straight grained white pine uppers only were considered good enough for match stock.

Beech as Flooring.

Is there any objection to beech as flooring material?

The only known objection to beech as flooring is that it checks. These checks, however, occur only in heart, and where heart boards are not used beech flooring is a fine product.

Siding Adaptable for New Brunswick.

What are the best kinds of siding to be used in New Brunswick? Also the best materials for the making of gutters?

Materials suitable for siding purposes in that locality comprise white pine, poplar, basswood, cottonwood and spruce. The best material available for the manufacture of gutters is either spruce or cypress.

Woods Used for Lath.

Can you give me any information about balsam and poplar and are these two woods manufactured into lath?

In the early days lumbermen of the old northwest paid but little if any attention to balsam timber. Recently, however, balsam, as well as many other of the neglected woods of the northern states, is being cut at the time other timber is secured and is manufactured into lumber of various kinds. It is possible that some of the lath produced at some of the northern plants

would contain a percentage of balsam, but balsam lath are not manufactured and sold as such.

Poplar is used for lath in the central state and to a considerable amount. As a matter of fact the refuse of nearly all kinds of commercial timber is converted into lath. Yellow pine lath have in the last few years made their appearance in the north and it is possible now to secure at points of production cypress, poplar, hemlock, white and other pines of the north and many other kinds of lath. According to the generally accepted idea of what constitutes a good lath material balsam would not be included in the list of available lath woods, but neither would a number of other woods which are now used extensively for that purpose.

Lath from Tamarack and Hemlock.

We are cutting some small tamarack and hemlock into 4-foot lengths for lath stock. The stock runs from 3 inches to 6 inches in size at the top end. Can you tell us about how many $\frac{3}{8}$ -inch by $1\frac{1}{4}$ -inch lath such stock would make to the cord?

The quantity of lath that this stock would make would depend entirely upon the quality of the material used. If the lath stock had many knots the number of lath produced would be comparatively small.

Demand for Hardwood Lath.

Is there any demand for hardwood lath?

Certain woods, such as pine, hemlock and cypress, are recognized as lath material, but as a matter of fact almost any of the softer woods can be manufactured into lath and disposed of. For example, while there can not be said to be a great demand for basswood lath or any fixed market for them, a good many are manufactured. Lath are manufactured in almost

every state, many of which do not produce pine or other coniferous woods. Thus, according to the last census Indiana, Kentucky, Ohio and Tennessee were all credited with the manufacture of more or less lath and as in none of these states pine is manufactured extensively, it is to be presumed that lath are there manufactured from hardwood. Poplar lath have a fixed place in the esteem of central state builders.

Use of Gum.

For what purposes is gum now employed?

This is rather a difficult question to answer, because every few weeks some manufacturer finds that gum will supply a new need, in part at least. When gum was first taken up in a general way it was hailed as the last of the substitutes. It seems rather strange that American lumber users should have neglected this wood for so long a time. Its value was recognized in England before it was in this country. Under the name of satin walnut, red gum has been in use in Europe for twelve or fifteen years. In more recent times sap gum has come in for its share of attention. Several years ago it was estimated that from 12,000,000 to 15,000,000 feet of red gum was used annually in Europe.

Locally, gum is used largely for common boards, dimensions and other house building materials. The better qualities now are being employed for wagon box boards and to some extent by furniture manufacturers. This latter use is made possible only by the improved method of handling and drying the stock. Another important use for gum is as the body of veneered furniture. Some of the lumber used in this way is sawed, but a part of it is cut with a veneer

machine. Gum does not appear to have any special field of its own any more, the use of the wood having broadened and become almost as general as that of many of the other important hardwoods.

Use of Red Cedar Lath.

We have had trouble recently with some lath which contained such a quantity of coloring matter as to stain through the rough and finishing coats of plaster. Will you please inform us what remedy there is in a case of this kind and what these lath, samples of which we send you, are cut from?

The samples received in this case were red cedar lath made from the same kind of timber as the shingle product of the Pacific coast. These cedar lath will stain plaster and in order to avoid trouble with the white coat, the rough coat should be allowed to become thoroughly dried before the finishing coat is applied. Cedar lath have given entire satisfaction during the last six or seven years in Colorado and Utah where they are used extensively. Complaint was made at first of the kind outlined, but when the peculiarity of this lath became familiar to the building trade it was easily overcome.

Use of Endogenous Woods.

Are any endogenous woods suitable for structural purposes?

In the United States practically nothing is done in this way with endogenous woods, although the yucca tree is used to some extent. In China, however, the bamboo is used not only in building but for almost everything else. To quote a gentleman who has made a study of Chinese bamboo and its uses:

The Chinese make masts of it for their small junks and twist it into cables for their larger ones. They weave it

into matting for floors and make it into rafters for roofs. They sit at the table on bamboo chairs and eat shoots of bamboo with bamboo chopsticks. The musician blows a bamboo flute and the watchman beats a bamboo rattle. Criminals are confined in a bamboo cage and beaten with bamboo rods. Paper is made of bamboo fibers and pencils of a joint of bamboo in which is inserted a tuft of goat's hair.

In Johnson's "Materials of Construction" the statement is made that bamboo is just twice as strong as the strongest wood in cross bending, weight for weight, when the wood is taken in specimens with a square and solid cross section.

Why Bamboo Is Hollow.

Why are some endogenous growths, like the bamboo, hollow?

Every endogenous growth has a pith canal running up through the center. In the case of the bamboo and other exceedingly fast growing endogens the surrounding fiber wood grows so fast that the pith is unable to keep up with it and finally shrivels up and ceases to exist.

INSPECTION.

Classification of Stained Norway.

Is there any rule by which stained norway pine is reduced in grade by the inspector?

So far as known there is no rule covering this matter that has anything like a wide application. The grade of stained norway is governed by custom. If the lumber is badly stained and the custom at that particular point calls for it, the inspector will reduce the grade.

Firsts and Seconds in Log Run.

What percentage of firsts and seconds should there be in a good grade of log run oak, quartered oak and birch?

Everything would depend upon the quality of the logs. A good average for plain oak would be 40 to 45 percent, quartered oak 50 percent and birch from 33½ to 40 percent. There is no settled rule covering the percentages of firsts and seconds in log run, as anything which embraces the contents of a log, culls out, would be called log run even though there might not be a foot of firsts or seconds in it. When the product of a mill is bought the buyer usually knows about what quality of logs will be cut and governs his expectations accordingly.

Disputed Grades.

Disputes in regard to grades are not infrequent. Inasmuch as there are accepted rules for grading what is the reason for disagreements?

In a business as large as the lumber industry there must arise from time to time disputes and misunderstandings in regard to the fulfillment of contracts; then again the very nature of saw mill products is such as to foster misunderstanding. No two boards are exactly alike, and while one piece of lumber may fulfill every detail of the specifications it might not prove serviceable for certain purposes. Another thing to be taken into consideration is the fact that there is a meeting point between one grade and the next lower or the next higher. It is possible and doubtless it is often the case, that a board may be a high grade No. 2 or a low grade No. 1, in which case it is optional with the grader into which it is put. In view of these facts it is easy to see where and how disputes arise and perhaps equally apparent why it is difficult to give

more than a general opinion in regard to the merits of any case.

Rejects.

What are meant by "rejects" in hardwoods?

In the east "rejects" form a grade which is used to a considerable extent and which is equivalent to the western term "common" in certain woods. In other words, it is understood to be a grade coming between firsts and seconds and culls. The old New York hardwood inspection classifies walnut "rejects" as follows: "Rejects are to be four inches and over in width; four and five inches of which shall be clear or clear on one side; six inches and over in width shall include all lumber not equal to the grade of seconds, two-thirds of each piece being merchantable. Heart boards or plank not admitted." In the west, however, hardwood manufacturers sometimes buy straight grades of lumber or log run and after selecting what they wish to use, put the balance on the market under the classification of "rejects."

Grading Before Lumber Is Trimmed.

Should hardwood lumber be trimmed before or after being tallied? Is it permissible to cut away a part so that the remainder may enter a higher grade, when the lumber is sold log run, mill culls out, at a flat price a thousand feet?

In buying the output of a mill log run, mill culls out, it is natural to suppose that everything above a mill cull is to be paid for on the basis of the number of board feet it contains. If it is not a mill cull then it is merchantable lumber and forms part of the mill product. A board 16 feet long, which for 10 feet of its length is without flaw, containing in the remaining six feet such defects as reduce the quality to No. 1

or No. 2 common, should be considered as a part of the mill product. The buyer, of course, is at liberty to cut or trim the lumber in any way he deems it to his advantage, but the producer is not concerned in this. Grading rule 3 of the Hardwood Manufacturers' Association of the United States says:

"Lumber must be inspected and measured as the inspector finds it full length and width. He shall make no allowance for the purpose of raising the grade."

This rule applies on the inspection of log run lumber as well as any other kind. Before the adoption of national hardwood rules it was the custom for an inspector to practice what was called "manufacturing lumber with a pencil." If a board which otherwise would be an upper had a streak of wane along its side or a rotten end which would reduce it to cull, the inspector would measure up the board minus an allowance to cover such a streak of wane or end and put it in as of the upper grade.

Inspection of Off Grade Hardwood.

What arrangement can be made for the inspection of off grade hardwood lumber shipped to retail dealers in Illinois?

An inspector can be secured from the Hardwood Manufacturers' Association of the United States by applying to the secretary, whose office is in the First National Bank building, Chicago. A charge of \$5 a day and expenses is made for the inspector's services.

Georgia State Inspection.

Has Georgia ever had a state department of lumber inspection?

In 1900 a bill was introduced into the Georgia legislature providing for such a department. The measure

was backed by prominent lumbermen of the state as a means of self-protection. At that time manufacture and grading in the Cracker state was very poorly done, as a rule, which caused all the lumber output from Georgia to be looked upon with suspicion by dealers. This bill, therefore, was sponsored by the manufacturers whose lumber, although all that could be desired, had to fight against the generally accepted idea that, being cut in Georgia, it was not up to grade.

Buying Mill Run Hemlock.

Where a customer buys hemlock, merchantable, mill run, culls out, and wants a merchantable grade loaded out, would there be any lumber in the culls which he should take?

If the buyer agreed to take the cut of a certain run of hemlock logs, mill culls out, at a specified price, he would be required, regardless of the way he had the stock loaded out, to accept as a part of the purchase such culls or No. 2 hemlock as would not properly go into a merchantable grade and which were above the grade of mill culls. In this case the contract should have read "merchantable hemlock, mill culls out," or "mill run hemlock, mill culls out," in order to avoid the confusion which results from the using of two terms which are not synonymous. Mill run hemlock ordinarily would be made up of the cut of the hemlock logs, mill culls out, and the merchantable hemlock, under the custom in Michigan, would be a grade of No. 1 and No. 2 hemlock. It would seem that where the buyer agreed to take "merchantable, mill run, mill culls out," and directed it to be shipped merchantable, throwing out a percentage of No. 2 which he did not want in the grade, he should accept and pay for such outs at the base price agreed upon for the entire purchase.

When Inspection Is Binding.

If a purchaser of lumber sends an inspector to the shipping point with instructions to tally the lumber with the inspector of the vendor, is the purchaser governed by the actions of such inspector?

If the inspector employed by the purchaser follows out his instructions to the best of his ability the purchaser is bound to receive as a proper grade the lumber which he has passed. If, however, the inspector waives the right to pass upon the material, and the lumber when received is not up to the grade called for by the contract, the purchaser is not held, for the courts will consider that the vendor, knowing the inspector to be hired for the purpose of protecting the interests of his employer, should not allow him to waive his right of inspection and that if it did so it would be acquiescing in the fraud practiced on the purchaser.

Uniform Hardwood Inspection.

With respect to uniform hardwood inspection, about which so much is heard, can you advise me if ever an agreement was reached and a system of rules evolved?

In the latter part of 1903 delegates from the Hardwood Manufacturers' Association and the National Hardwood Lumber Association met in Chicago and after several days' arduous labor adopted a system of rules. These committees were clothed with full power to act and when the rules were published it was thought they would be the basis of official inspection for hardwood lumber in the United States. As a matter of record it might be well to reproduce the names of those representing the two associations:

Representing the Hardwood Manufacturers' Association of the United States: R. H. Vansant, chairman;

W. M. Ritter, J. W. Love, C. Crane, J. H. Himmelberger, F. C. Fischer, William Threlkeld, A. G. Wetmore and Henry Maley.

Representing National Hardwood Lumber Association: Theodore Fathauer, chairman; J. M. Pritchard, G. Von Platen, W. A. Bennett, J. W. Graham, A. R. Vinnedge, W. S. Darnell, H. C. Humphrey, B. F. Clark, A. G. Wetmore, Hugh McLean, R. M. Carrier, W. H. White and E. C. Colcord.

It is perhaps needless to add that these rules never came to be the standard of inspection. The hardwood trade not yet was ready for the millennium, each faction preferring to have its own way, in so far as it could, rather than to concede anything to the opposition.

Status of the Official Inspector.

Smith receives an order from Jones, an eastern wholesaler, for lumber that Smith does not happen to have at that time. Brown, a manufacturer, claims to have it at his mill and Smith places the order with him and instructs him to ship lumber strictly up to the grade specified by Jones and to ship it in Smith's name. When the lumber arrives at destination Jones advises that it is not up to grade and refuses to receive it. Smith instructs Jones to have it inspected by a licensed inspector, which is done. The inspector is recommended to Smith by a disinterested lumber firm in no way connected with Jones. The inspector reports a large percentage of the lumber below the grade claimed by the shipper. Jones is willing to settle with Smith according to report made by the inspector and Smith thinks the shipper ought to settle on same basis. The shipper refuses to settle that way. In addition to the report of the inspector Jones claims he can prove the lumber was not up to grade by two or three of his workmen who are familiar with the grading rules. If Brown should bring suit against Smith will Smith have to settle according to Brown's claim? and who will have to pay the expenses of

storage, extra handling, inspection etc. caused by lumber not being satisfactory?

One thing we would like to know is whether the report of a disinterested, competent inspector is considered better by the courts than the report of any one else who claims to know how to grade lumber.

The report of the inspector must stand. It is the only standard in the lumber business and it is seldom the case that the verdict of the inspector is questioned. On the basis of the rules recognized as official for any market or any wood the inspector, as near as it is possible for him to do so, subdivides lumber into the various grades, having no interest either in raising or lowering the quality of any grade.

Usually the loser pays and in this case the loser would be Smith. Occasionally the charges for inspection are shared. There is no rigid rule.

Inspection of Tupelo.

Have any grading rules been adopted governing the inspection of bay poplar (tupelo)?

The Southern Cypress Manufacturers' Association, which has headquarters at New Orleans, La., adopted rules for the inspection of bay poplar or tupelo gum March 1, 1906. The grading rules provide that lumber shall be inspected on the poorer side; tapering boards shall be measured at the narrow end and in lengths of even feet; lumber shall be sawed of full and even thickness, and scant sawed lumber shall be reduced to the next standard thickness. Standard lengths are 4 to 16 feet and standard thicknesses are $\frac{3}{8}$ -inch, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3 and 4 inches when dry. All lumber less than one inch in thickness shall be measured face measure. Standard grades are box boards, first and second clear, No. 1 common, No. 2 common and No. 3 common. Specifications of the standard

grades and further information can be obtained from the association.

Savannah Inspection.

What is "Savannah inspection," and are the rules now in force?

At a meeting of the Georgia Interstate Saw Mill Association, held at Tifton, Ga., January 12, 1904, decisive measures were taken to do away with the heart inspection rules applicable to longleaf pine. These rules were adopted in 1883 and were commonly called "Savannah merchantable," but the trade had virtually outgrown them. Still they remained as a handicap to the manufacturers in their competition in the coastwise and foreign markets with producers in other longleaf pine sections.

At the Tifton meeting a new set of inspection rules was adopted, approved at a subsequent meeting of the Georgia Interstate Saw Mill Association held at Valdosta, Ga.

The classification rules that overlie the rules of inspection, as adopted at the Tifton meeting, are as follows:

Boards—Under 2 inches thick by 6 inches and upwards wide.

Plank—Two inches thick and up, under 6 inches thick, by 6 inches and up wide.

Scantling—2x2 inch to 5x5 inch.

Dimension timber—6x6 inch and larger.

The inspection rules read as follows:

First—All lumber in the above classification must be sound, well manufactured, full size and saw butted, free from through splits and shakes, knot holes, loose and unsound knots.

Second—By a thorough shake or split is meant one through or connected from side to side, edge to edge, or side to edge.

Third—In the measurement of dressed lumber the width and thickness of the rough piece before dressing must be counted.

It will be seen that the classification and rules of inspection virtually provide for log run grading as applied to product for coastwise shipment and export. A finer manipulation and grading naturally followed the adoption of these modified rules. What the south-eastern operators sought was to do away with the old feature of "Savannah merchantable," or heart specifications, as applied to the seagoing trade.

Grading of Russian Timber.

How are Russian timber and timber products graded?

Russian grade rules for lumber are almost infinite, and each separate grade is divided and subdivided to take into account every possible variation in quality. The item of firewood, for instance, does not mean just plain firewood as we understand the term, but embraces all kinds of firewood. Each different species of timber is tested and the amount of heat it will give ascertained, also the ease with which it may be split up and sawed. Two kinds are never put into a grade unless they are identical in intrinsic value—they must either be capable of producing the same amount of heat or one must be very easy to work into stove length, which quality will make up for deficiencies in other ways. Fagots $2\frac{1}{2}$ inches in diameter and 4 to $5\frac{1}{2}$ feet long are tied into bundles without sorting for length and are known as fire brushwood.

Firewood, however, is merely a byproduct and no tree will be devoted to its production which possibly can be used for any other purpose. Russian commercial products are divided into round and square timbers, poles, railroad ties, swan planks, and boards,

staves, shingles, lath etc. Round timbers used in buildings and for bridges must be at least fifty-six feet in length with no rot, few knots and the diameter at the smaller end at least two-thirds of the middle of the stock. Russian exports are chiefly round timber, pine and fir, 18, 24, 30, 36, 42, 48 and 54 feet long, 9 inches and up in diameter.

Rules for Classification of Mahogany.

What rules govern the customs officials in classifying and appraising mahogany imports?

In March, 1904, Gen. Thaddeus S. Sharretts laid down the following rules for classification of such lumber in future specifications and prices not intended to include logs used for veneering purposes:

Firsts—Boards, 8 or more inches in width and 10 feet and upward in length, and clear of defects.

Common—Five inches and upward in width and 8 feet and upward in length, and shall not be less than 75 percent free from defects, and may include the grades of mahogany known to the trade as log run and dimension stock.

Culls—Of either of the above sizes having knots, sap and other blemishes.

Mill culls—Very small and irregular shapes and inferior in other respects.

MEASUREMENT.

Standard Width and Thickness.

Are there such things as standard widths and thicknesses in the lumber trade?

There is no such thing as a standard width or a standard thickness which is accepted as such in all

sections of the United States. In the west and south the majority of manufacturers cut their lumber so that it will run scant inch, or two-inch, as the case may be, and also of scant width. The term 2x4 in these sections, therefore, would be understood by all lumbermen to mean a piece under 4 inches wide and a little less than 2 inches thick (usual size being $1\frac{1}{8}$ x $3\frac{3}{8}$). In other sections lumber is cut plump according to specified measurements. In these matters local custom prevails and the lumberman ordering inch stock from a section where scant cutting is the recognized rule would not be able to sustain an action upon receipt of lumber which did not run full inch.

Joists, East and West.

What is the difference between "joists" in the east and the west?

In the west a joist is a piece 2x6 and up to 3x14, but in the east it is $2\frac{1}{2}$ x4 or 3x4 and 12 or 14 feet long. What is known as a joist in the west would be called a plank in the east.

Estimating Contents of Lumber in Pile.

How can the board measure contents of a pile of lumber 7x8—24 feet long be estimated? Please give a short method of arriving at correct contents of cubicals reduced to board measure.

In arriving at the board measure contents of a pile of lumber everything would depend upon the way the lumber was piled. Inasmuch as it might be stripped with 1-inch or $1\frac{1}{2}$ -inch cross strips no rule could be laid down for arriving at the board measure contents of the pile. If the lumber is stock width then the easiest way to arrive at the amount would be to count the number of boards in each layer, the number

of layers, multiply them, determine how much each piece contains and multiply by the number of pieces. Probably the best way to determine the contents of a pile of random width boards would be to multiply the width of the pile by the number of layers, then by the length of the lumber, and in this manner reduce it to board feet. An easy way to find the number of board feet in a cube is to determine how many feet board measure there are in each lineal foot. Take a piece 8x8 24 feet long. Each inch in length contains sixty-four cubic inches. It is possible, however, to eliminate the cubic inch from consideration and figure the contents on the basis of surface measure. Each lineal foot would contain sixty-four inches surface measure, and as a piece 12x12 inches makes a board foot—providing the material is an inch thick—it would give $5\frac{1}{2}$ feet for each lineal foot. This would give 128 feet board measure for a piece 8x8 24 feet long.

Thickness of Rough Inch Lumber.

We have received from a shipper of hemlock a lot of inch boards and find that the majority of them run $\frac{3}{8}$ -inch thick. On taking up the question of an allowance for thin boards shipped us the shippers declare it is the practice where the lumber is cut one inch in thickness to allow $\frac{1}{8}$ -inch for shrinkage during seasoning and shipment to destination and they will not allow our claim. Will you please advise us if this is in accordance with the generally accepted rules for the inspection of hemlock, and if so give us the authority for; and if otherwise give us authority for this statement also?

With some exceptions the practice is to cut inch stock in the rough of a thickness to allow for shrinkage in drying and to permit of both sides being surfaced, the finished product to be thirteen-sixteenths of an inch

thick. Exceptions to this rule are found in the east, where the trade has been supplied to a large extent with lumber that would surface two sides to $\frac{7}{8}$ -inch thick, and in the Wisconsin hemlock field, where at least some of the manufacturers allow for surfacing only on one side to 13-16-inch. Rough stock $\frac{7}{8}$ -inch thick cannot be dressed two sides to 13-16, though boards 15-16 of an inch thick rough can be surfaced both sides to the specified thickness.

Hemlock manufacturers have no generally accepted standard of gages. Even in Wisconsin some of the manufacturers cut their inch boards of varying thickness; some provide for surfacing two sides to 13-16, others one side to the same thickness. In the former case it would require at least 15-16-inch board in the rough when dry and in the latter probably $\frac{7}{8}$ would answer. This would mean cutting the green stock a full inch to allow for surfacing two sides and 15-16 probably drying to $\frac{7}{8}$, when one side shall be surfaced.

Eastern consumers formerly were supplied with inch lumber that would surface two sides to $\frac{7}{8}$, but of late years the use of southern pine and western woods has caused important deviations from the standard.

It would be a question of proof as to the custom of manufacture and of the Philadelphia market. Practically all lumber is cut scant and this practice has been so general as to become almost exclusively the custom in all parts of the country. Take dimension, for instance: The standard gage of the Southern Lumber Manufacturers' Association for 2x4s dressed one side and one edge is $1\frac{5}{8} \times 3\frac{5}{8}$. In the north some of the hemlock producers dress their 2-inch dimension to $1\frac{3}{4}$, others to $1\frac{1}{2}$, so that while attempts have been made at uniformity along this line they have not been entirely

successful and have not been adopted by all the manufacturers of any one kind of lumber.

As to whether or not the lumber supplied was in accordance with the generally accepted custom it can only be said that in some markets it would be so regarded and in others it might possibly not be.

As to the authority for the statement it scarcely is possible to cite one, as practically all of the association gages apply to dressed lumber and not to rough, though the rough stock should be of a size to produce the specified dimension called for in the dressed product. In view of this requirement eastern hemlock should not be sawed so thin that after drying out it will not leave margin for the dressing of both sides to at least 13-16-inch thick, and the manufacturer who makes a practice of sawing lumber so thin is not conducting his operation correctly and is not acting in accordance with even the loose and ill defined customs obtaining in the hemlock trade.

Measurement by Petersburg Standard.

What is the Petersburg standard hundred?

The Petersburg standard hundred is a unit of lumber measurement recognized in the British isles. It is the equivalent of 120 pieces $1\frac{1}{2} \times 11$ inches and 12 feet long, or 165 cubic feet. It is a very inconvenient measurement, being out of touch with the superficial foot, the cubic foot, the square of the hundred foot superficial and the load (fifty cubic feet).

Cutting Lumber by Consecutive Feet and Inches.

Would it be an advantage to cut lumber by consecutive feet and inches instead of by the present standard even feet and inches?

At first glance it would seem that such a change

would accomplish a considerable saving in lumber on the supposition that a board that would not cut quite 10 inches would cut 9, under the consecutive system, and would not have to be cut down to 8 to conform to the present standard width. Practically, however, there would be but little saving, as these odd strips are almost all worked up into lath or molding. On the other hand, such a change would mean that the number of sizes would be multiplied, so that every manufacturer, wholesaler and retailer would have to enlarge his yard space to take care of these additional sizes, and that the work of caring, sorting and piling would be increased. The consecutive system was used in the east and even now Adirondack spruce is cut 13 feet long and in widths of from 5 to 9 inches. Northern pine manufacturers for years have cut random width boards. The practice is not as general now as formerly.

Board Measure.

What is board measure?

Mathematically a board foot is a piece of lumber 12 inches long, 12 inches wide and one inch thick. Thus it would seem that a board foot was equivalent to 144 cubic inches. In practical calculations, however, the custom of the trade has made an arbitrary definition which gives to the term a fluctuating value as to contents. Where lumber is an inch or more in thickness, board measure is calculated on the basis above given, but where it runs less than an inch in thickness, board measure means simply surface measure, and the lumber which is less than an inch in thickness is treated as though it were an inch in ascertaining the contents. Thus, a board ten feet

long, six inches wide and one inch thick would be said to contain five board feet, its actual contents, considering a board foot to contain 144 cubic inches. Were the same board resawed, however, and two pieces ten feet long, six inches wide and a scant half inch in thickness obtained, the board measure of these two pieces would be ten board feet, although in actual contents there would be in the two latter boards a fraction less lumber than in the first board. A recent treasury department decision, however, indicates that in future the United States government will use commonsense in assessing import duties.

Lineal or Board Feet.

Will you kindly give your interpretation of the following order: "5,000 feet 2¼ battens at 45 cents a hundred."

It is difficult to see how anyone familiar with the lumber business could misinterpret an order of this kind. Battens of all kinds almost without exception are quoted at so much a hundred lineal feet. There can not be two systems of measuring the amount of lumber shipped on any order, and 45 cents a hundred wouldn't much more than pay the saw bill on any kind of lumber.

How to Measure Resawed Inch Lumber.

If a thousand feet of inch lumber were resawed how much lumber will it make?

This is a hoary headed question. A board foot of lumber, mathematically, is 144 square inches of surface one inch in thickness. By all rules and customs of the lumber trade, however, lumber less than an inch in thickness is counted as an inch. That is to say, the superficial measurement is taken and the board figured as though it were an inch thick. There-

fore in resawing 1,000 feet of inch lumber a product would be obtained which if put on the market would sell as 2,000 feet, although of course in actual cubical measurement there would be only 1,000 feet, or rather, something less than 1,000 feet, allowing for kerf.

Sizes in Worked Hardwood Ceiling.

We recently purchased a car of chestnut ceiling to be worked $\frac{7}{8} \times 2\frac{1}{2}$ inches face and in ordinary length, ten to sixteen feet. The shipper claims that he has a right to count this as $3\frac{1}{4}$ -inch strip, while we maintain that he is only entitled to 3-inch strip. Which is correct?

Flooring and ceiling with a $2\frac{1}{2}$ -inch face is a somewhat unusual size. The bulk of such material in both hard and soft woods is finished $2\frac{1}{4}$, $3\frac{1}{4}$ and $5\frac{1}{4}$ inches, allowing three-quarters of an inch for working. Manufacturers hold that it is impossible to turn out first class products with only $\frac{1}{2}$ inch margin for tongued and grooved stock. The shipper's contention appears to be a fair one and is in accordance with the grading rules of the Hardwood Manufacturers' Association of the United States.

English vs. American Systems of Measurements.

What are the points of difference in English and American lumber measurements?

The American system of measuring lumber on the basis of 1,000 feet is now used in England in figuring American importations and to some extent for the domestic trade. The British system is a cumbersome combination of "string" measure, "caliper" measure, "foot," "cube," "loads," "tons" and "standards." The contents of round or square timbers are determined by the string or caliper rule, which, however, gives slightly different results. The method employed

is to determine the number of cubic feet in the consignment under consideration, which thereafter is reduced to "tons" or "loads." Forty cubic feet are called a ton and fifty cubic feet a load. Sawed lumber, that is, deals, planks, battens etc., are measured by the "standard." A number of these "standards" are in use, but the most popular is the Petersburg, which contains 1,980 feet board measure.

Custom in Measuring Poplar Plank.

We sold a car of poplar planks for export and are having some difference of opinion as to the measurement of same and would like to have your ideas along this line. The order read as follows: "One car No. 1 and No. 2 poplar planks 3 to 6 inches thick, 10 inches and up wide, to average 13 or 14 inches wide, 10 feet and up long. Lumber must be surface dry." The party who purchased this stock, when he came to take it up, insisted that it should be figured and measured in even inches in width, and not willing to give and take in the widths the same as in measuring 4-4 or domestic stock. We contend that as long as the order did not specify that it should be measured in even inches in width it should be measured the same as other stock and that should it be more than $\frac{1}{2}$ inch over a certain width we should be given the advantage, while if it is under $\frac{1}{2}$ inch over even inches he should take it at even inches; also to take and give when they run even $\frac{1}{2}$ inch over even inches.

It is presumed from the statement given that the manufacturer sold this lumber to an exporter, not direct to a foreign buyer. The wording of the order is clear in everything except that pertaining to the manner in which the width of the plank should be calculated. This omission brings up a very difficult and puzzling question, one which cannot be answered with any creditable amount of satisfaction.

The order calls for random widths—nothing less

than 10 inches wide and the entire consignment to average at least 13 inches wide. In view of this range in width desired it would not seem that any special dimension was necessary in order to meet the needs of the party to whom the lumber ultimately was to be delivered. According to American lumber shippers' ideas the contents of a plank are to be computed at the nearest even inches; thus a piece $14\frac{1}{2}$ inches wide or over was to be figured as though it were 15, and under $14\frac{1}{2}$ as though it were 14. On the point of division— $14\frac{1}{2}$ —the seller takes the fraction, in the same way as the fraction of cents are computed in making change. Briefly, this is the custom which exporters have endeavored to establish and the basis on which they seek to sell when lumber for export is bought in this country. When it is shipped abroad and inspected by the rules of the market to which it is delivered it is customary in some places—London, for instance—to insist upon full width, and for some purposes a piece of lumber $11\frac{3}{4}$ inches wide would not answer for a 12-inch board. In other cases the importer gives and takes on the half inch as outlined.

In measuring certain kinds of random widths in this country it is customary to use a tape, each board being computed at its exact width; so many feet of tape representing a thousand feet of lumber of any given length.

To Measure a Bunch of Shingles.

How is it possible to check up shingles so as to determine whether full measure is given?

A bunch of shingles should contain fifty layers of shingles twenty inches wide. They should be packed closely so as not to leave more than $\frac{1}{2}$ to $\frac{3}{4}$ of an

inch of space on each layer. This would give 1,000 inches of shingles or 250 pieces 4 inches wide.

Odd Lengths.

What are odd lengths and is their establishment desirable?

By the term odd lengths is meant lumber cut to an odd number of feet, such as 5, 7, 9, 11, 13 etc., as against the even lengths, 8, 10, 12, 14, 16 etc. Their use is desirable from the viewpoint of the manufacturer inasmuch as it would result in economy in manufacture; that is to say, the utilization of all material possible to get out of the log. In the old country, where the domestic timber supply is light, odd lengths are used because of the necessity for practicing economy in lumber manufacture. In the United States the question of cutting odd lengths has been agitated considerably by the manufacturers and this year (1906) a resolution was introduced at one of the big manufacturers' association meetings that certain percentages of odd lengths be included in carload orders. This movement met with decided opposition from retailers, however, and the custom was not generally adopted. Some of the objections of the retailer to odd lengths are that their use would entail a multiplication of assortments, with a corresponding increase in yard and shed room, that the trade, and especially the contractors and carpenters, who had been educated to the use of even lengths, would seriously object to the new dimensions and that the retail dealer who would be compelled to force these undesirable lengths upon his trade could do so only by losing the odd foot. Thus a man who wished to purchase 16-foot stuff and could not use 18-foot would take 17 only at the 16-foot price. Even at the

16-foot rate he probably would object on the ground that he would be forced to cut the board down to the required length, and the retailer would be out a foot of lumber for which he had had to pay.

Metric Measurements, Equivalents in English Measurements.

What are the English measure equivalents of the more important metric units?

MEASURES OF LENGTH.

1 centimeter equals .3937 inch; 1 inch equals 2.54 cm.

1 meter (100 cm.) equals 3.281 feet; 1 foot equals .3048 m.

1 meter equals 1.0936 yards; 1 yard equals .9144 m.

1 kilometer (1,000 m.) equals .621 mile; 1 mile equals 1.609 km.

MEASURES OF SURFACE.

1 square centimeter equals .155 square inch; 1 square inch equals 6.452 cm².

1 square meter equals 10.764 square feet; 1 square foot equals .0929 m².

1 square meter equals 1.196 square yard; 1 square yard equals .8361 m².

1 square kilometer equals .3861 mile; 1 square mile equals 2.59 km².

1 hectare (10,000 m.—2) equals 2.471 acres; 1 acre equals .4047 ha.

CUBIC MEASURE.

1 cubic centimeter equals .06102 cubic inch; 1 cubic inch equals 16.387 cm³.

1 cubic meter equals 35.31 cubic feet; 1 cubic foot equals .02832 m³.

1 cubic meter equals 1.308 cubic yards; 1 cubic yard equals .765 m3.

MEASURES OF CAPACITY.

1 cubic centimeter equals .0338 fluid ounce; 1 fluid ounce equals 29.6 cm3.

1 liter (1,000 cms.) equals 1.056 quarts; 1 quart equals 947 l.

1 liter equals .264 gallons; 1 gallon equals 3.79 l.

1 liter equals .91 quarts, dry measure; 1 quart, dry measure, equals 1.10 l.

1 hectoliter (100 l.) equals 2.838 bushels; 1 bushel equals .3523 hl.

MEASURES OF WEIGHT.

(1 gram equals weight of 1 cubic centimeter of water at its maximum, density, slightly above freezing point.)

1 gram equals 15.432 grains; 1 grain equals .0648 gram.

1 gram equals .035274 ounces av.; 1 ounce equals 28.35 grams.

1 kilogram (100 grams) equals 2.205 pounds av.; 1 pound av. equals .4356 kg.

1 millier (1,000 kg.) equals 1.102 tons; 1 ton equals .907 t. (tonneau or metric ton, same as millier).

How to Measure Odd Size Sticks.

Kindly let me know how many board feet there are in a piece of timber 12x12 inches at one end, tapering to 6x6 inches at the other, and fifty feet long. Also let me know if two correct answers can be given by using different methods.

There seems to be a diversity of opinion in regard to the question outlined above. A friend in Oregon has sent in this solution, which of course settles the matter beyond dispute:

Add together the areas of the two parallel surfaces; and four times the area of the section taken half way between them, and parallel to them; multiply the sum by the perpendicular distance between the two parallel sides; and divide the product by 6.

The contents of a stick of timber 12x12 inches at one end, 6x6 inches at the other end and 50 feet long is 350 feet board measure.

Another eminent authority has sent in a prepaid dispatch which reads:

Stick 12x12 tapering to 6x6, 50 feet long, contains 600 feet and a \$10 sawing bill. At \$15 a thousand the stick would cost \$19.

Combining the solutions that have been given the following result is secured, which may be applied to any sized stick of lumber of the kind considered in this connection.

Add the area of one parallel surface to the wages of the head sawyer. Divide this sum by the time required to ship a car of yellow pine from Texas to Chicago. From the result subtract the demurrage charges. Extract the square root of the remainder and divide by the Hoo-Hoo 9. Multiply the sum by the perpendicular and the result will be confusing, but undoubtedly will be right. Here are some others.

A Minnesota correspondent sends in the following in regard to the manner in which odd sized sticks of lumber should be measured. The communication is of interest in that it gives the rule for measuring several kinds of odd shaped pieces, as will be noted:

The usual rule for figuring pieces of this shape is: To the sum of the areas of the two ends add four times the area of the middle section, parallel to them, and multiply this sum by one-sixth of the height.

I suggest to anyone who, like the writer, has not been bumped up against calculus and conic sections for eighteen or twenty years that he build a tank sufficiently large to

hold conveniently the crosseyed stick, fill the tank with water, submerge the stick, note the volume of water and stick, take out the mathematical nightmare and the difference between the volume of the water with the stick submerged and what remains with the stick eliminated is the volume of the stick. This formula is by the author of "Scotch Navigation; or, Main Strength and Ignorance" (copyright not applied for).

Accompanying the simple method of solution outlined were a number of diagrams, fully illustrating the stick in its crosseyed condition and after it had been resolved by a process of destructive distillation into a certain well defined shape, producing by this method and a little imagination two solid bodies 6x6 inches square, 50 feet long, and four pyramids 3x3 inches at base, 50 feet long, which the correspondent alleges contains 350 feet and in support of this contention offers the proof outlined in the extract of the letter given.

European Measurements.

What systems of lumber measurement are most prevalent on the continent of Europe?

The systems of measurement differ with the districts and those for import and export trade are different in many cases from those used in domestic business.

In the districts of Königsberg, Memel and Tilsit English measures are used for foreign business (which is about all that there is); in Dantzig, English, Rhenish and old French feet and inches and the meter. For trade to England and Denmark the freight for the latter point is figured in English "loads" of fifty cubic feet each. Posen uses the metric system, also the Rhenish foot, 32.346 cubic feet going to a cubic meter. The same is true of Berlin. Breslau has the metric system, but if feet are used they are Rhenish. Magde-

burg gets much rafted lumber down the Elbe from Bohemia and this is often measured by the Saxon "ell" of two Saxon feet. Rhenish feet and inches and meters are also employed here. The "schock" is sometimes used, the conversion being in the ratio of 270 meters—860 Rhenish feet—886 English feet to one schock. In Vienna only metric measures are known, except in connection with staves, which are measured by French inches, of which thirty-six measures 976 millimeters. In Thorn the old "zopf" still is used for standing and round timber. In Hamburg the metric is the leading standard, but it is to be expected that a port having so much trade with foreign countries must take cognizance of foreign measures, be these ever so ridiculous in their relations with each other. For foreign shipments freight may be reckoned in "English freight measure," "gross measure," "caliper," "Queen's caliper," "gross caliper freight measure," etc., as well as in cubic feet. In Bremen the sole measure given in the official regulations seems to be metric, but no doubt it is here, as well as in all other shipping and receiving ports, necessary to be able to convert metric into other units, and vice versa. In Trieste are used the meter and the foot; staves are measured in width by inches and in thickness by lines. There are unfortunately two kinds of inches arising from the previous political relations of the province—the Viennese of twenty-six millimeters and the Venetian of thirty. Bromberg has the metric system alongside the Rhenish; logs in the water are measured by the old Rhenish "kettenmass" or chain measure. In Riga, Russia, where, of course, the meter is also legal, planks are measured by the "standard" of 165 English cubic feet. The "hobelgesellschaft," or union of planing mill proprietors, uses as legal measures the meter and its derivatives, but decrees

that where feet are used the relation shall be as 328 to 100.

In general it may be said that wherever the lumber dealer has to do with countries using the foot and inch and other nonmetric units, he has often to buy or sell in that measure; but wherever the work is for local consumption and is done in Germany only the metric system is used.

New York Sizes.

What is meant by "New York hemlock sizes"?

This expression as applied to hemlock refers to $2 \times 2\frac{1}{2}$, 10, 12 and 13 foot lengths, $2\frac{1}{2} \times 4$, 9, 10, 12, 13, 14 and 16 foot lengths and 2×4 , 18 and 20 foot lengths. These are practically the only dimensions of hemlock used in the New York market. They are employed almost exclusively for studdings and partitions in flat buildings and have acquired the name "New York sizes."

Board Measure Versus Surface Measure.

Our representative sold a carload of basswood lumber to be delivered west of here. The following is a copy of the order:

"One car basswood, rough, $\frac{5}{8}$ inch, at \$48 B. M., f. o. b. _____," which is properly signed by purchaser.

Upon receipt of the order we wrote our customers saying that we had no $\frac{5}{8}$ -inch but would supply 1-inch at same price, although the freight would cost us considerably more. They replied accepting, but now they tender us a settlement of \$30 a thousand, claiming this to be correct, $\frac{5}{8}$ of \$48 = \$30. This was not our intention when selling this, as we expected to get \$48 a thousand for it.

Kindly advise if the mere fact of our representative putting "B. M." on the order would commit us to accepting the \$30. He did not intend it to mean as our customer interprets it.

On the basis of the ex parte statement made by the vendor he would be entitled to recover from the purchaser the price of \$48 a thousand, based on the surface measurement of the stock in question. Under the terms of the sale as expressed by him he would be entitled to \$48 a thousand, surface measure, whether he had shipped $\frac{5}{8}$ -inch stock or 1-inch stock, as under the compromise agreement.

However, if evidence can be presented that would constitute proof, showing that a palpable error had been committed in the quotation which resulted in the sale, i. e., that \$30 a thousand rather than \$48 a thousand constituted the market price of the grade and thickness of $\frac{5}{8}$ -inch basswood sold, delivered at the point of delivery, the seller would probably not be able to collect more than \$30 a thousand feet.

Board Measure Discussed.

I want to take issue with you in regard to the meaning of board measure when applied to lumber less than one inch thick.

I cannot understand how anyone can take the position that you take in this matter when you state that board measure and surface measure are synonymous terms when applied to lumber less than one inch in thickness and I think that if you will submit the question to ten or twelve practical lumbermen you will find that they will not agree with you. In my estimation there is only one definition of board measure and that means that a piece of lumber twelve inches square and one inch thick is one foot.

Where lumber is sold $\frac{5}{8}$ -inch thick the price is either board measure or surface measure. It cannot be sold both ways for one price and in this instance the salesman evidently made a mistake and sold it board measure when he intended to sell it surface measure.

I take it that where $\frac{5}{8}$ -inch lumber is sold and nothing said as to whether it is board or surface measure the custom of that locality would rule and that the price would tell which measure it was sold on.

I know you contend that when lumber is one inch or less in thickness board measure and surface measure are synonymous but that when lumber is thicker than one inch the two terms are entirely different.

It seems to me that it is a very poor rule that will not work both ways, and I candidly believe that the position you have taken in this matter in board measure has done more to cause confusion and doubt than anything else.

This is an ancient and honorable question and one which should be approached with that veneration and respect which its mature years and gray hair deserve. More confusion and more disputes arise from a misunderstanding or wrong application of this than any other one thing having to do with the sale of lumber.

It is intimated by the correspondent that where thin lumber is sold and nothing said as to whether on the board or surface measure basis the custom of the locality should decide and that the price should give a clew as to the manner in which the lumber was computed. Custom is a mighty poor thing to rely upon because it must be proved and because it varies, and today when lumber is manufactured in Washington and sold in New York, or manufactured in Texas and sold in Minnesota local customs do not cut much figure. What the lumber industry needs is the adoption of rules which should clear up this matter once for all. The attitude of the manufacturers and dealers themselves is inconsistent and this can be shown by taking the price list of any association or any dealer. For instance, the official list of the Yellow Pine Manufacturers' Association quotes bevel siding, say, at \$15 a thousand feet and 1½-inch finishing stock at \$31.50 a thousand feet. Now, if a customer should send in an order for 1,000 feet each, of the bevel siding he would get enough to cover 1,000 square feet of surface and of the 1½-inch select enough to cover 800 square feet of surface; yet

so far as any intimation in the list is given he would have as much right to expect enough $1\frac{1}{4}$ -inch stock to cover 1,000 square feet of surface as he would of the siding. Of course every lumberman knows and everyone who uses lumber knows that $1\frac{1}{4}$ -inch stock would be figured on a board measure basis; that is, a piece of lumber 12 inches square and $1\frac{1}{4}$ inches thick contains $1\frac{1}{4}$ feet, which means one and one-fourth of the price quoted; on the other hand the siding, though there is nothing to indicate the fact, is estimated on the basis of superficial area or surface measure.

In the board measure system the unit is a piece of lumber twelve inches square on the surface and one inch thick. This rule is invariably applied in computing all thicknesses of one inch or more but nothing is reckoned as thinner than one inch. This is the rule laid down by a number of authorities on lumber measurement.

From the illustration given it will be seen that lumbermen in practice actually do reckon in both ways, although a contrary view is held by our correspondent. In order to show the inconsistency of the views expressed, take inch stock quoted on the ordinary price list. As a usual thing—it might almost be said as a general rule—inch stock when dressed is only $13/16$ -inch, yet this is figured on a board measure basis, and a manufacturer would consider a claim for a rebate or reduction on account of the scant thickness of inch lumber as the claim of a madman. The LUMBERMAN can see no reason why the same rule will not hold good on $\frac{5}{8}$ -inch stock, and if it does not hold good, then what is the basis for figuring $\frac{5}{8}$ -inch stock? Suppose a man ordered 1,000 $\frac{5}{8}$ -inch panel board measure; how much lumber should he receive? Suppose he ordered

1,000 feet of 13/16-inch stock; how much should be sent?

The AMERICAN LUMBERMAN has contended all along that lumbermen in practice consider everything under one inch as inch lumber and manufacture and sell it as such. Now, whether they call this board measure, surface measure or superficial measure is immaterial and while deviation from this rule may be practiced in some sections it is in general use to such an extent as to make it almost everywhere the custom.

If manufacturers are becoming tired of the frequent disputes arising from this source they should go into their association meetings this year and add one little provision to their rules of grading and inspection to be framed something after this fashion:

All lumber is manufactured to correspond with the sizes adopted as the standard by this association and all lumber is computed on a basis of the size of the rough stock from which it is produced except stock less than one inch in thickness, which shall be figured as one inch thick.

Manufacturers make allowance for this stock in the price placed on it and there is no more reason in estimating what it contains in standard board feet than there is in making an allowance for 13/16 dressed lumber, which, so far as the AMERICAN LUMBERMAN has ever had any intimation, is always sold for inch stock.

Liverpool Measurement.

What is meant by the term "customary Liverpool measurement?"

This system of measurement at Liverpool originated in the early days when the bulk of the importations received at that port came in the shape of rough-hewn logs. It meant that an allowance from the log contents would be made for wane, sap, shake and other

defects, and for tapes. The custom has continued in an allowance made on manufactured lumber, although on the latter the whole of the defect is not eliminated, that is to say, on waney edged boards half of the wane is allowed and for shakes at either end one-half of such shakes is allowed etc. The objection made to this system by American shippers is that the elimination of the defects which had placed the lumber in the grade or grades in which it was purchased would raise it to a higher grade or grades and that therefore the defects either should be measured in and the full count allowed or else measured out and the lumber considered as of the higher grade and, consequently, higher value.

Lumber Measurement Abroad.

What system of measurements is used in England and other foreign countries? What does "standard" mean in our measurement as used by London and Liverpool correspondents in giving the amount of stock in those markets?

The English unit of measurement is called the standard. The higher denomination is the "standard hundred" which, with the exception of the Quebec standard, consists of 120 pieces of the standard. This system of measurement is used in England and many of the other countries with which England carries on intimate trade relations. The London standard is equal to one 3x9 inches, 12 feet long, or 27 feet board measure as we understand that term. The Petersburg standard is a piece of lumber 1½ inches thick, 11 inches wide and 12 feet long, containing 16½ feet. The Christiania standard is 1¼ inches thick, 9 inches wide and 11 feet long, equal to 10½ feet. The Quebec standard is 2½ inches thick, 11 inches wide, 12 feet long and contains 27½ feet of lumber. With the exception of Quebec, the "hundred standard" means

120 pieces of any of the above sizes mentioned. This measurement is used to calculate the extension of boards, deal and plank.

Square timbers according to the English custom are sold by the cubic foot, or by the "ton," consisting of 40 cubic feet, or the "load" of 50 cubic feet.

In figuring round logs it is customary in some parts of England to add the circumference of the log at each end, divide by two for the mean girth, and in finding the contents of a log the rule has been to take one-quarter of the mean circumference in inches and multiply it by itself and then by the length of the log in feet.

Customs differ in various parts of the world, and of late some changes have been made in regard to the methods of ascertaining the contents of a log, but the square timber and board measurement given above is that in general use in the countries named.

TARIFF.

Effect of Import Duty on the Michigan Industry.

How were Michigan lumbermen affected by the \$2 import duty on lumber and the Canadian prohibition of export of logs?

At first it was thought these regulations would end lumbering in the Wolverine state, the white pine in the lower peninsula having been practically exhausted. As a matter of fact, this \$2 import duty proved a blessing in disguise. Michigan lumbermen turned their energies to the manufacture of hemlock and hardwoods which hitherto had been neglected. There were many thousands of acres of these woods in the eastern part of the state, and in every case their manufacture

showed a satisfactory profit. Hemlock, which in the palmy days of white pine manufacture was considered of no value, showed a profit of \$4 to \$5 a thousand feet. In these operations the saw mill plants were of a more permanent character. Early day operations were marked by the building of numerous saw mills around which would spring up small towns, which were abandoned as soon as the timber in their immediate vicinity was cut out. In the latter day operations, however, the saw mills and kindred institutions were built to stay.

Duties on Cabinet Woods for Ship Construction.

Under what classification are duties on cabinet woods which are to be used in ship construction assessed?

This question has been argued in all its phases and the board of general appraisers has decided that cabinet woods and other woods for interior finishing do not come within the meaning of ship timber or ship planking, but are assessable as cabinet woods even though intended for use in ship construction.

How Reciprocity Affects the Lumber Business.

To what extent is the lumber industry of this country affected by reciprocal relations with Canada?

Not to such an extent now as formerly. The tariff is rather a delicate subject, but the attitude of lumbermen is clearly set forth in a story related by an eastern spruce manufacturer. In 1857 this country enjoyed a brief period of reciprocity with its northern neighbor. At that time there were thirteen saw mills in one section of northern Vermont. After reciprocity had been in effect a few months twelve of these mills were sold out by the sheriff. No. 13! that was owned by the sheriff—the fees saved it.

Duty on Fireproofed Lumber.

Under what classification is fireproofed lumber dutiable?

Following a precedent laid down in a decision of the United States Circuit Court of Appeals in a late case, the board of general appraisers at Washington has ruled that sawn lumber, which has been chemically treated and rendered fireproof and is used as a substitute for incombustible materials, but which retains the characteristics of ordinary sawed lumber, is not a manufacture of wood and is dutiable as lumber at \$2 a thousand feet board measure.

Effect of Removal of Tariff on Canadian Lumber.

What effect would the removal of the import duty on Canadian lumber have upon the American lumber market?

If the lumber market were in good shape the removal of the tariff on Canadian lumber would have no immediate effect upon prices obtained in American markets. It would be only a short time, however, before the removal of the duty would have a marked effect. The reason for this is that the Canadian mills are cutting to capacity and have only a limited market in the United States. A part of the Canadian product is coming over the border in spite of the duty, because prices are high enough to permit Canadian manufacturers to pay the duty and still sell at a fair profit. The demand in the United States is fully up to the supply and, therefore, even though a little more lumber were shipped from Canada, it would have practically no effect on the home market. The removal of the duty, however, would be the signal for the erection of many new mills for cutting Canadian timber. Their operation would result in a greatly increased exportation of Canadian lumber to the United States.

To what extent production and exports could be increased is a debatable question on which authorities do not agree.

Tariffs Affecting White Pine.

In the tariff legislation between the United States and Canada how was the white pine trade affected?

In the following table of tariff acts is shown the charges made on pine logs and lumber. It is assumed that rough lumber and logs were dutiable when not enumerated and when a general duty was attached to all woods or to manufactured woods not specifically mentioned:

DATE OF ACT—	<i>Pine logs.</i>	<i>Pine lumber, rough.</i>
July 4, 1789.....	5 percent	5 percent
May 2, 1792.....	Free	7.5 percent
July 14, 1832.....	Free	25 percent
September 11, 1841.....	Free	Free
August 30, 1842.....	Free	20 percent
July 30, 1846.....	30 percent	20 percent
August 5, 1854 (Canadian)	Free	Free
March 3, 1857.....	24 percent	15 percent
March 2, 1861.....	20 percent	20 percent
July 14, 1870.....	Free	20 percent
June 6, 1872.....	Free	\$2 per M feet
October 1, 1890.....	Free	\$1 per M feet
August 13, 1894.....	Free	Free
July 24, 1897.....	Free	\$2 per M feet

Duty Assessed on Thin Lumber.

What method is followed in assessing duty on lumber less than an inch thick where the duty is assessed on the number of feet board measure?

The board of general appraisers at Washington has decided that in ascertaining the number of board feet contained in lumber less than an inch thick deduction shall be made so as to grant a proper allowance

for the difference in thickness. That is to say, a board of given area an inch thick would contain, for the purpose of assessing customs duty, twice as many board feet as a board of the same area $\frac{1}{2}$ -inch thick. The reverse of this rule also would apply in the case of pieces thicker than an inch. While this decision is in a measure different from the ordinary custom of figuring the surface of lumber it is an equitable method of arriving at the assessment of duty.

Duty on Lumber and Naval Stores.

Please give me the duties charged by the United States on lumber, rosin and spirits of turpentine imported into this country.

Schedule D of the tariff act of July 24, 1897, known as the Dingley tariff, which is still in force except as modified in some of its terms by treasury department decisions, gives as in the dutiable list the following: Timber, hewn, sided or squared, used for spars or in building wharves, 1 cent a cubic foot; sawed boards, planks, deals and other lumber of whitewood, sycamore and basswood, \$1 a thousand feet; sawed lumber not specially provided for in this act, \$2 a thousand feet. Where lumber of any sort shall be planed or finished is levied in addition to the rates otherwise provided 50 cents a thousand feet board measure for each side so planed or finished; if planed on one side and tongued and grooved, \$1 a thousand feet; if planed on two sides and tongued and grooved, \$1.50 a thousand feet. In connection with this provision for duty on sawed lumber is the so-called "retaliatory clause," reading as follows:

Provided, that if any country or dependency shall impose an export duty upon sawlogs, round, unmanufactured timber, stave bolts, shingle bolts or heading bolts exported to the United States, or a discriminating charge upon boom

sticks, or chains used by American citizens in towing logs, the amount of such export duty, tax or other charge, as the case may be, shall be added as an additional duty to the duties imposed upon the article mentioned in this paragraph when imported from such country or dependency.

The above clause was designed to prevent the imposition by Canada of an export duty upon logs etc. Canada, however, avoided its application, in large part, by simply refusing to allow the exportation of sawlogs cut from crown lands. In some cases, however, as in pulpwood, discrimination in the stumpage dues or royalty is made by giving a rebate of part of the dues in case the wood should be manufactured into pulp in Canada. This custom has been declared by United States customs officials as equivalent to an export duty and the amount of the discrimination has been charged as a duty against importations of pulpwood so discriminated against which otherwise would be free.

Paving posts, railroad ties and electric poles are charged 20 percent ad valorem.

Bundled kindling wood is charged a duty of .3 percent per bundle, according to size.

The duty on sawed cabinet woods, such as cedar, lancewood, mahogany, rosewood etc., is 15 percent ad valorem; on veneers, 20 percent ad valorem.

The duty on clapboards is \$1.50 a thousand; on lath 25 cents a thousand pieces; on pickets, palings and staves 10 percent ad valorem; on shingles 30 cents a thousand.

The above are the principal items, mention of which will no doubt sufficiently answer the inquiry of our correspondent as to the lumber duty. On the free list, however, are logs and round unmanufactured lumber, including pulpwood, handle and shingle bolts etc. and cabinet woods of foreign growth.

in regard to rosin, the crude product is admitted free into this country, but if other than crude it is charged $\frac{1}{4}$ cent a pound plus 10 percent ad valorem. If in small blocks for violin bows the charge is 20 percent advalorem.

Spirits of turpentine is admitted free.

PART VII.—STATISTICAL.

PRODUCTION.

Record Lumber Year for Iowa.

In what year was the greatest amount of lumber produced in Iowa?

In 1890 Iowa mills cut 762,648,277 feet as against 713,336,049 feet in 1892, the next highest year.

Output of Saginaw Valley.

What has been the total output of lumber in the Saginaw valley?

Including pine, hardwood and hemlock the total production of the Saginaw valley from 1851—the first year in which a cut was recorded—to and including 1899, was 23,685,959,203 feet. The banner year was 1882, when 1,011,274,905 feet was manufactured in the valley.

White Pine Production of Menominee River District.

What has been the white pine output of the Menominee river since 1868?

Since the beginning of the saw mill industry of the Menominee river district over 10,000,000,000 feet of white pine has been manufactured. The biggest cut on the river was in 1888, when 650,000,000 feet was made into lumber.

Lumber Product and Uses.

Of the total lumber product of the United States what are the percentages which go into different uses?

The following table, which is based upon the census figures of 1900, gives a fair idea of the way the lumber products of the United States were divided in that year. The figures given are based upon the unit of 1,000,000,000 feet board measure:

Lumber from conifers.....	26.15 billion feet, b. m.
Lumber from hardwoods.....	8.63 billion feet, b. m.
Shingles	12.10 billion pieces
Lath	2.52 billion pieces
Staves	1.66 billion pieces
Hoops	0.44 billion pieces
Heading	0.12 billion sets
Carriages and wagons.....	0.08 billion feet, b. m.
Agricultural implements	0.03 billion feet, b. m.
Furniture	0.11 billion feet, b. m.
Bobbins and spools.....	0.04 billion feet, b. m.
Pickets and paving.....	0.04 billion feet, b. m.
Railroad ties	0.06 billion pieces
Telegraph and telephone poles.....	0.12 billion pieces

Some Statistics of the Lumber Industry.

What are the capital invested, valuation, profits and position of the lumber business in the United States, and more particularly in the state of Wisconsin?

At various times the lumber industry has been summarized and figures given showing its importance as compared with other lines of work.

The lumber industry, according to the returns of the bureau, was, in 1905, the fourth among the great manufacturing industries of the country, being exceeded only by the products of iron and steel, textiles and the slaughtering and meat packing products. Figures showing the number of establishments, capital employed and various phases of the work are:

	1905.	1900.	1890.	1880.
Number of establishments.....	32,276	33,035	22,617	25,708
Capital	\$1,013,827,138	\$611,611,524	\$557,881,054	\$181,186,122
Salaries of officials, clerks etc.....	45,555	12,530	20,375	.....
Salaries	\$ 48,571,861	\$ 11,260,608	\$ 11,203,757	.....
Wage earners, average number	735,945	283,280	311,964	147,956
Total wages.....	\$ 336,058,173	\$104,640,501	\$ 87,934,284	\$ 31,845,974
Men 16 and over.....	708,357	277,900	306,415	141,564
Women 16 and over.....	16,673	1,748	2,281	425
Children under 16.....	10,915	3,612	3,268	5,987
Miscellaneous expenses.....	\$ 130,850,824	\$ 17,731,519	\$ 23,844,637	.....
Cost of materials used.....	518,908,150	317,923,548	242,562,296	\$146,155,385
Value of products, including amount received from custom work.....	1,223,730,336	566,832,984	437,957,382	233,268,729

It is contended by some of those identified with the lumber industry, that had the census figures included the value of cordwood and pulpwood and embraced every lumbering and logging operation in the country the lumber industry would have been placed at the head of the list. Some doubt exists as to the truth of this contention, but it safely may be said that even the enormous total given does not represent all of the timber of commercial size that is used each year and consequently the value of that not included does not appear in the total value of forest products.

In 1900 Wisconsin took first rank among the lumber states of the country. Comparing the figures given herewith with those for the United States and for Washington for 1905 shows to the advantage of the latter:

	<i>Washington.</i>	<i>Wisconsin.</i>
Number of establishments.....	1,004	576
Capital invested.....	\$40,953,816	\$37,677,205
Total average number employees...	28,023	28,118
Total wages.....	\$18,613,318	\$13,857,446
Cost of materials.....	16,325,954	15,818,278
Value of products.....	49,572,512	44,395,766

Rank of the Minnesota Lumber Industry.

What is the rank of the lumber industry of Minnesota compared with other manufactures of the state?

In rank the lumber industry of Minnesota gives precedence only to the flouring mills with the planing mills in sixth place. The revenue from lumber manufacturing during the last twenty-five years has been from \$25,000,000 to \$40,000,000 annually and remanufactured products have added from \$3,000,000 to \$7,000,000 a year. The development of Minnesota's forest resources has been progressing for more than fifty

QUESTIONS AND ANSWERS.

333

years. The following table shows in detail the saw and planing mill industries in 1900 and 1905:

LUMBER AND TIMBER PRODUCTS.

	1905.	1900.
Establishments, number	222	288
Capital	\$28,953,854	\$32,972,462
Wage earners, number.....	17,213	20,524
Wages	\$ 8,651,071	\$ 9,493,637
Miscellaneous expenses	6,333,459	3,694,168
Cost of material.....	12,302,578	20,964,762
Value of products.....	33,183,309	42,689,932

PLANING MILL PRODUCTS.

	1905.	1900.
Establishments, number	94	61
Capital	\$ 5,310,239	\$ 2,489,374
Wage earners, number.....	2,858	1,639
Wages	\$ 1,482,431	\$ 667,091
Miscellaneous expenses.....	423,134	133,850
Cost of material.....	4,978,161	2,619,848
Value of products.....	7,949,212	3,988,276

The following table shows the relative importance of different kinds of lumber produced in Minnesota in 1900 and 1905:

	1905.		1900.	
	Quantity, feet.	Value.	Quantity, feet.	Value.
White				
pine ..	1,853,806,000	\$27,245,572	2,148,032,000	\$26,485,923
Norway				
pine ..	48,276,000	616,868	105,359,000	1,089,996
Oak	13,856,000	197,589	28,823,000	390,036
Bass-				
wood ..	8,392,000	109,954	5,252,000	55,935
Tama-				
rack ..	7,681,000	109,886	105,000	900
Elm	2,652,000	32,511	4,790,000	44,020
Poplar ..	2,135,000	26,523	248,000	3,134
All other.	5,000,000	69,017	22,112,000	268,232
Totals..	1,942,248,000	\$28,407,920	2,314,721,000	\$28,338,226

Pacific Coast Lumber.

How is the lumber production of the Pacific coast states divided in regard to kinds of wood manufactured?

The following tables show the total cut as reported from Washington, Oregon and California for 1902, 1903, 1904 and 1905:

PRODUCTION IN 1902.

Kind—	Washington.	Oregon.	California.	Totals.
Fir	916,294,000	458,586,000	20,527,000	1,424,097,000
Cedar	128,546,000	8,446,000	985,000	138,882,000
Spruce	86,535,000	20,921,000	3,650,000	112,646,000
Redwood ..	.....	.....	119,476,000	119,476,000
Sugar pine.	3,300,000	3,550,000	125,653,000	132,653,000
Other pine.	78,603,000	65,672,000	113,235,000	448,367,000
Oth. sftwd.	19,511,000	13,146,000	19,474,000	73,850,000
Hardwoods.	29,584,000	904,000	112,000	30,600,000
Gd. totals.	1,280,373,000	571,225,000	403,112,000	2,480,571,000

PRODUCTION IN 1903.

Kind—	Washington.	Oregon.	California.	Totals.
Fir	1,782,361,000	510,961,000	71,181,000	2,464,503,000
Spruce	108,129,000	44,574,000	29,802,000	182,505,000
Cedar	121,342,000	18,441,000	6,601,000	146,384,000
Redwood ..	.....	.....	536,654,000	536,654,000
Sugar pine.	.....	2,775,000	109,279,000	112,054,000
Other pine.	172,164,000	91,492,000	350,454,000	614,110,000
Oth. sftwd.	2,007,000	1,350,000	.....	3,357,000
Hardwoods.	539,000	1,613,000	9,000	2,161,000
*Shingles	6,013,993,000	36,455,000	1,063,910,000	7,114,358,000
Gd. totals.	2,186,541,000	671,206,000	1,103,980,000	4,061,728,000

PRODUCTION IN 1904.

Kind—	Washington.	Oregon.	California.	Totals.
Fir	1,796,030,000	669,273,000	97,278,000	2,562,581,000
Cedar	287,751,000	19,047,000	6,121,000	312,919,000
Spruce	88,567,000	32,023,000	20,964,000	141,554,000
Redwood ..	.....	20,000	472,435,000	472,455,000
Sugar pine.	.....	4,275,000	127,736,000	132,011,000
Other pine.	169,127,000	87,104,000	224,791,000	481,022,000
Oth. sftwd.	9,770,000	10,716,000	2,000,000	22,486,000
Hardwoods.	.....	2,293,000	6,000	2,299,000
Gd. totals.	2,351,245,000	824,751,000	951,331,000	4,127,327,000

PRODUCTION IN 1905.				
Kind—	Washington.	Oregon.	California.	Totals.
Fir	2,427,145,000	890,109,000	82,338,000	3,399,592,000
Spruce	129,355,000	58,403,000	32,741,000	220,508,000
Cedar	266,568,000	15,660,000	7,915,000	290,599,000
Redwood ..	.....	20,400,000	529,568,000	549,968,000
Sugar pine. ....	.....	4,352,000	134,385,000	138,737,000
Other pine. 184,164,000	.....	111,556,000	271,711,000	467,431,000
Oth. softwd. 16,693,000	.....	7,554,000	27,699,000	51,946,000
Hardwoods. 21,200,000	.....	2,125,000	34,000	23,359,000
Gd. totals.	3,045,125,000	1,110,159,000	1,086,391,000	5,149,141,000

Redwood Production Since 1894.

How much California redwood has been used since 1894?

The growth of the redwood trade has been remarkable, but steady and healthy. From the counties of Humboldt, Del Norte and Mendocino, in the last six months of 1894, 76,154,399 feet of redwood lumber was shipped. In the same period of 1906 shipments aggregated 171,735,274 feet, or an increase of 125.5 percent in the twelve years. The following table shows the redwood shipments from 1894 to 1895 inclusive, and gives a fair idea of the growth of the industry:

YEAR—	Feet.	YEAR—	Feet.
1894.....	152,279,120	1900.....	209,001,022
1895.....	207,251,928	1901.....	244,386,075
1896.....	165,894,888	1902.....	262,597,015
1897.....	203,595,250	1903.....	301,343,953
1898.....	188,871,500	1904.....	324,676,960
1899.....	217,708,464	1905.....	347,679,159
1906 (estimated) .....	.....	.....	365,000,000

Lumber Trade With Latin America.

Please give a recapitulation of the lumber trade carried on between the United States and the Latin-American countries.

The following is a comparative statement of imports and exports of 1905 and 1906, showing the value of our

336 THE CURIOSITY SHOP; OR,

lumber trade with the Latin-American nations, these tables having been compiled by the International Bureau of the American Republics:

IMPORTS.				
ARTICLE—	<u>June.</u>		<u>Twelve months.</u>	
	1905.	1906.	1905.	1906.
Wood, mahogany—				
Cent. America..	\$ 74,322	.....	\$ 644,534	\$ 471,207
Mexico	48,086	\$28,203	326,868	460,209
Cuba	623	2,647	88,509	120,231
South America.	761	.....	42,445	22,498
Totals	\$123,792	\$30,850	\$1,102,356	\$1,074,145
EXPORTS.				
Wood and manufactures of:				
ARTICLE—	<u>June.</u>		<u>Twelve months.</u>	
	1905.	1906.	1905.	1906.
Wood, unmanufactured—				
Cent. America..	\$ 42,412	\$ 66,680	\$ 434,503	\$ 543,058
Mexico	83,067	161,347	696,903	1,076,334
Cuba .....	.....	2,820	37,391	173,936
Argentine Rep..	923	3,326	36,362	166,727
Brazil .....	.....	.....	8,961	3,050
Chile	3,695	1,998	34,674	112,664
Colombia	162	.....	17,689	19,593
Other S. Am...	176	446	64,604	93,904
	\$130,435	\$ 236,617	\$ 1,331,087	\$ 2,189,266
Lumber—				
Cent. America..	38,018	192,313	391,986	830,097
Mexico	123,587	194,561	1,922,853	1,943,945
Cuba	177,032	205,980	1,602,264	2,459,604
Argentine Rep..	100,169	395,160	2,158,055	3,551,851
Brazil	20,231	127,417	588,887	500,669
Chile	10,411	78,105	315,027	639,892
Colombia	2,107	.....	55,306	21,419
Venezuela	1,603	1,974	14,489	17,553
Other S. Am...	58,158	40,944	591,847	779,406
	\$531,316	\$1,236,454	\$ 7,640,714	\$10,743,636

Furniture—				
Cent. America...	16,123	23,683	160,526	315,542
Mexico	67,700	80,590	647,475	848,279
Cuba	69,797	47,983	567,809	720,338
Argentine Rep.	37,210	38,147	229,471	381,851
Brazil	4,046	12,621	28,885	54,353
Chile	5,303	8,430	38,953	76,336
Colombia	2,676	854	47,429	21,550
Venezuela	806	1,278	32,661	36,960
Other S. Am...	6,182	8,339	91,090	82,196

	\$209,843	\$ 221,925	\$ 1,844,299	\$ 2,487,415
Totals	\$871,594	\$1,694,996	\$10,816,180	\$15,420,317

The outlook for trade with these countries is very alluring and the Panama canal will increase the demand for lumber for construction purposes and for use in housing laborers in the canal zone.

United States Exports During 1905.

Have any statistics been published showing the quantity of pitch pine, Oregon pine and other woods exported from the United States during 1905, and also the countries to which the stuff was shipped?

The AMERICAN LUMBERMAN publishes monthly reports of the exports of timber, lumber, shingles, shooks etc. from every port in the United States, the amount consigned to each foreign port, or the value of such shipment, as the case may be. It would, of course, be impracticable to give a detailed statement embracing these figures for 1905, but the following condensed report probably will convey the information desired. The figures are in round numbers, but are accurate enough for all ordinary purposes.

Pacific coast—Timber (sawn) 86,584,000 feet, (hewn) 3,460 cubic feet; logs etc., \$119,430; boards, deals and planks, 225,625,000 feet; joists and scantling, 705,000 feet; shingles, 7,428,000 pieces; shooks, \$81,460; manufactures of lumber, \$590,000.

Gulf coast—Timber (sawn) 296,375,000 feet, (hewn) 2,373,300 cubic feet; logs etc., \$1,277,500; boards, deals and planks, 638,776,000 feet; joists and scantling, 18,410,000 feet; shingles, 8,320,000 pieces; shooks, \$352,530; manufactures of lumber, \$1,800,000.

What is known as pitch pine in England is called longleaf yellow pine in the southern states, and the Gulf coast output may be taken as embracing manufactures of that species. Oregon pine (Douglas fir) is exported from the Pacific coast, but the figures given include a small percentage of redwood, it being impossible to separate them in the existing records. The Gulf exports include considerable hardwood and hardwood manufactures.

The principal foreign buyers of southern pine are England, Italy, Germany, the Netherlands and Portugal; of Pacific coast lumber, England, Mexico, Japan and British Australia.

VALUES.

Cost of Paving Materials.

What are the relative costs of paving materials?

It is not possible to state the price of any particular kind of paving material, which could be considered an absolute figure, as local conditions govern. The following are actual prices of some of the materials used in Chicago a square yard in 1896: Asphalt, \$2.50; macadam, \$1.38; granite, \$4.06; vitrified brick, \$2.71.

In Galveston the following prices a square yard obtained: 6-inch cypress blocks, \$2.60; 6-inch cresoted pine blocks, \$2.65; 5-inch cresoted pine blocks, \$2.45; vitrified brick on 4-inch concrete foundation, \$2.11; vitrified brick on brick foundation, \$1.80.

Reckless Price List Distributer.

In what manner do retail dealers suffer by reckless distribution of price lists?

One of the worst enemies retail dealers have is the reckless distributor of price lists. Many persons who are not legitimate dealers are in possession of these books and circulars. While in some and, in fact, many instances they do no harm yet occasionally they fall into hands that can and do have some influence. Then the dealer is face to face with the fact that he has either got to sacrifice a just profit or let his customer go. In nearly every instance where such people buy away from home they are required of course to pay the cash in advance; and on the other hand if they have left out some little item they may need then they come around and buy on time, and never forget to boast how cheaply they can buy of some of the mail order concerns.

Values of Walnut.

Will you kindly give us information regarding the values of walnut timber and lumber?

A statement of market conditions in 1906, issued by the Hardwood Manufacturers' Association of the United States, gives the following range of values on walnut lumber:

THICKNESS—	<i>Firsts and seconds.</i>	<i>No. 1 common.</i>	<i>No. 2 common.</i>
1 -inch.....	\$ 97	\$52	\$31
1 ¼ -inch.....	107	58	32
1 ½ -inch.....	107	58	32
2 -inch.....	112	56	31
2 ½ -inch.....	130	62	36
3 -inch.....	130	62	36
4 -inch.....	140	70	36

In regard to the value of walnut timber it is scarcely possible to set any price or range of prices. Walnut, like other hardwoods, is not a continuous growth and an acre of ground may yield one tree or a half dozen. The wood has become very valuable and low grade stock is worth slightly more than medium grade oak. The value of a tract of timber depends upon the cost of getting the logs to the mill and also upon their quality.

Yellow Pine Manufacturing Cost.

What does it cost to produce a thousand feet of manufactured yellow pine on the cars at point of shipment?

The following compilation of manufacturing expenses was made by a representative operator on yellow pine in Mississippi and is believed to be fairly representative of the cost of production in that section in 1903:

Log cutting.....	\$.47	
Log hauling to skids.....	1.32	
Log loading, skids to cars.....	.21	
Railroad hauling, average twelve miles.....	.48	
Total logging cost		\$ 2.48
Sawing	1.53	
Dry kilning.....	.09	
Planing	1.46	
Trucking and stacking.....	.52	
Car loading.....	.26	
Repairs .....	.13	
Total manufacturing cost		\$ 3.99
Interest and discount.....	.50	
Profit and loss.....	.03	
General expense and insurance.....	1.22	
Depreciation .....	.75	
Total miscellaneous		\$ 2.50
Stumpage		2.00
Total cost of lumber, thousand feet.....		\$10.97

Early San Francisco Lumber Prices.

When was lumber first marketed in San Francisco and what price did it bring?

The first records of lumber sales in San Francisco were in 1849. It was rough pine lumber and sold for \$300 a thousand.

Fixed Lumber Values.

Why do not millmen give retailers a little time to breathe between changes? It would suit them better. A steady market is the best for all concerned.

Conditions up to and including the present time have not permitted of the establishment of a fixed value on lumber such as is placed on certain staples in the hardwood or grocery line. While supply and demand are the controlling factors in all values it has been found impossible to make lumber prices as rigid and unyielding as are selling prices of other commodities. While the retail lumberman acts in the capacity of agent or intermediary between the lumber producer and the lumber consumer he should not assume the position of protector of one against the other. In other words, if the price of lumber should go up the stock in the hands of the yardman should profit by the advance. No reason exists why a retail dealer forced to pay \$1 to \$2 a thousand more for his supplies should not increase his selling prices to the same extent, as is the general practice in other lines.

It should be borne in mind by the retail fraternity that the lumber manufacturer has not unlimited control over prices. He is forced to name a value that will include every item of cost of production and leave a margin of profit in the transaction for himself. With the price of stumpage of all kinds advancing and the cost of labor and supplies increasing from

year to year it is natural that lumber prices should be higher.

Opposition to High Prices.

Years of experience as a lumber manufacturer have taught me that one of the most difficult things to overcome is the opposition to advancing prices. Not only do consumers object to an increase in what they pay for their supplies, but many other kinds of opposition are encountered. There are times when prices are forced upward by logical conditions rather than as a result of the producers' initiative. I would like to have your ideas on this phase of the business.

Human nature is so constituted that the average individual objects to paying more or receiving less than he has been accustomed to. Business men have an uncomfortable inclination to ask more and give less rather than to give more and ask less.

With respect to lumber affairs there are times when adjustment of values on a higher level may be characterized as legitimate. For instance, when the demand is in excess of the supply, and the output, present and prospective, is below the requirements a somewhat radical increase is warranted under present business conditions. Under such circumstances, a "bear" campaign is inaugurated. Buyers are sent scouring over the country, picking up stocks wherever they may be found and at the lowest possible prices. Every possible bear argument is used in carrying on campaigns of this kind. It is not unusual to sacrifice stocks picked up in this manner to impress other holders.

Frequent change of prices operates to incense buyers, and many shippers probably would profit by a system where the list was allowed to remain unchanged for a stated period, even though the bulk of

the sales were made at higher prices. This idea does not meet the approval of those who believe the list price should be the selling price, which has not always been the rule in the past—possibly the exception rather than the rule.

In so far as opposition to higher lumber prices is concerned, the people of this country have had the advantage of low priced lumber for so long that they object to paying anything like the scale of prices charged in other countries. They are coming to such a price level, however, gradually and unwillingly. As to why buyers object to high prices for lumber, the reason, it is presumed, is the same as that of a lumber manufacturer who objects to paying more for supplies or labor—the distinctively human one of selfishness.

Figuring Stumpage Cost.

In arriving at the cost to him of the lumber he manufactures should a mill man figure his raw material at the price he paid for his stumpage?

If he does so he is conducting his business along different lines from those pursued by men engaged in other lines of industry. Because a man purchased stumpage ten years ago in, say Louisiana, for 25 cents a thousand feet, it does not follow that he should figure his raw material on the basis of 25 cents a thousand feet when the market value is \$3.50. Ten years ago he invested a certain amount of money in timber and took the chance of its value receding from the point at which he purchased it and of it being destroyed by fire or wind. None of these calamities having overtaken him and the price having advanced enormously owing to scarcity of timber in other sections and to the success following the in-

roduction of yellow pine into new markets, he has realized a handsome profit on his venture. It seems as if he should consider this a transaction and classify it as an investment upon which he has realized and in figuring into his cost sheet the price of his raw material should figure the present market price of the timber. If he were undecided as to whether he should sell the timber or manufacture it, undoubtedly he would figure what he could realize from the sale of the timber. Then he would take the estimated cost of putting in a manufacturing plant, together with what it would cost him to run the same for a period sufficient to finish the operation, add to this taxes on land and mill, insurance on the latter, estimated cost of repairs, labor, including selling force, office expense, add the interest on the money represented by the timber and which would be represented by the plant, add to this the cost of food for the men and the animals he would require, then throw in a little more for incidentals. Against the sum of these he would set the amount he could reasonable expect to realize from the sale of the manufactured product together with the estimated selling price of the plant after the work had been completed and if there were a reasonable profit margin shown between the balance and the selling price of the timber he probably would decide to manufacture. If any one should suggest to him, however, that in his calculations he should enter his timber for 25 cents a thousand feet, he would immediately say "Why, I can get \$2.50 a thousand feet right now. If my calculation does not show a profit in the manufacture of the timber above its present market value I would better not manufacture it."

Highest Price Paid for White Pine.

What is the highest price ever paid for white pine lumber?

In 1903 some clear ship decking was purchased at \$200 a thousand, which is believed to be the highest price ever paid for white pine lumber.

Prices of White Pine.

What has been the range of values in white pine lumber?

The following table was compiled from the books of an old Buffalo wholesale house and, therefore, represents actual transactions:

PRICES OF WHITE PINE LUMBER.

	4-4	4-4		4-4	4-4
	Uppers.	Culls.		Uppers.	Culls.
1862—July	\$18	\$ 7.50	1884—January ...	\$48	\$13.00
1863—January ..	19	8.50	July ...	46	12.00
July ...	25	11.00	1885—January ...	46	12.00
1864—January ..	30	13.00	July ...	45	11.50
July ...	30	15.00	1886—January ...	45	11.00
1865—January ..	38	16.00	July ...	45	11.50
July ...	28	11.00	1887—January ...	45	12.00
1866—January ..	30	12.50	July ...	45	12.00
July ...	45	14.00	1888—January ...	45	13.00
1867—January ..	45	14.00	July ...	44	12.50
July ...	45	14.00	1889—January ...	43	12.50
1868—January ..	45	14.00	July ...	43	12.50
July ...	45	14.00	1890—January ...	44	12.50
1869—January ..	45	14.00	July ...	43	12.50
July ...	45	14.00	1891—January ...	43	12.50
1870—January ..	45	14.00	July ...	43	12.00
July ...	43	13.00	1892—January ...	44	12.00
1871—January ..	40	13.00	July ...	46	12.50
July ...	42	13.00	1893—January ...	48	13.00
1872—January ..	50	16.00	July ...	48	13.50
July ...	50	16.00	1894—January ...	47	13.50
1873—January ..	50	17.00	July ...	45	13.00
July ...	46	12.50	1895—January ...	45	12.00
1874—January ..	44	12.50	July ...	45	11.00
July ...	44	11.00	1896—January ...	44	11.00
1875—January ..	42	10.00	July	44	11.00

	<i>4-4</i> <i>Uppers.</i>	<i>4-4</i> <i>Culls.</i>		<i>4-4</i> <i>Uppers.</i>	<i>4-4</i> <i>Culls.</i>
July	40	9.00	1897—January ...	45	11.00
1876—January ..	37	9.00	July	45	10.00
July	37	9.00	1898—January ...	45	10.00
1877—January ..	37	9.00	July	45	11.00
July	33	9.00	1899—January ...	46	12.00
1878—January ..	30	9.50	July	51	14.00
July	28	10.00	1900—January ...	*57	19.00
1879—January ..	28	10.00	July	*57	17.00
July	28	9.00	1901—January ...	58	16.50
1880—January ..	36	12.00	July	60	16.50
July	42	12.00	1902—January ...	68	16.00
1881—January ..	45	12.00	July	73	16.00
July	44	12.00	1903—January ...	80	16.50
1882—January ..	46	13.00	July	82	17.00
July	47	13.00	1904—January ...	82	18.00
1883—January ..	47	13.00	July	80	18.00
July	47	13.00	1905—January ...	82	18.50

*Add 50 cents to these two items.

A comparison of these prices would not give an adequate idea of the changes in white pine values without reference being made to changes which have occurred in the quality of the lumber, and also to certain changes in money values. Thus, while there has been less change in uppers than in any other grade, there is a great difference in the white pine upper of today and the white pine upper of Civil War times, the latter having been wider and with a larger percentage of absolutely clear lumber. The culls of forty years ago contained much lumber that if it were graded today would go into higher classifications, and much of the present day cull stock would then have been considered useless. The depreciated currency of the 60's is shown in the rapid rise in prices which obtained until 1870. The tariff bill also had something to do with the range of values, although it was not marked. The abolition of the \$2 duty made during

President Cleveland's first administration was followed by a corresponding reduction in the price of uppers and their values continued to sag during the following five years.

Average Values of Pacific Coast Lumber in 1900 and 1905.

Give a comparison of the relative values of lumber produced on the Pacific coast.

The following table gives the values of the various kinds of lumber produced on the coast, together with an average for each state:

<i>—California.—</i>		
	<i>1905.</i>	<i>1900.</i>
Redwood	\$12.83	\$10.12
Yellow pine.....	12.73	10.87
Sugar pine.....	15.79	12.41
Red fir.....	12.42	9.97
Spruce	10.96	10.98
Cedar	20.34	11.54
All others.....	23.14	14.00
Average	13.06	10.61
<i>—Oregon.—</i>		
	<i>1905.</i>	<i>1900.</i>
Red fir.....	\$ 8.88	\$ 9.03
Yellow pine.....	10.13	8.82
Spruce	10.92	9.41
Cedar	12.62	10.86
Hemlock	7.93	8.00
All other.....	11.41	12.16
Average	9.21	9.12
<i>—Washington.—</i>		
	<i>1905.</i>	<i>1900.</i>
Red fir.....	\$ 9.63	\$ 8.73
Yellow pine.....	9.56	8.15
Cedar	9.86	10.63
Spruce	9.74	8.31
Hemlock	9.60	9.68
White pine.....	15.31	11.10
All others.....	13.33	12.23
Average	9.66	8.60

Acre Versus Stumpage Valuation.

Is the acre or thousand basis more desirable for stumpage valuation?

Originally timber was sold altogether on the acreage basis, but in the very great majority of sales now the figures are on estimates of so much a thousand feet. The thousand foot basis seems the more logical way of selling timber. An acre of timber means absolutely nothing and in order to arrive at its value as a lumber proposition, it must be cruised and an estimate made covering the number of thousand feet standing upon it. Therefore it seems reasonable that as long as the stumpage must be figured on a thousand feet basis, it might as well be sold on that basis.

Cost of Production.

What does it cost to produce southern pine lumber, including allowance for stumpage, and how is the cost figured?

A number of operators have submitted statements. In January, 1904, in the longleaf section of Mississippi, stumpage was figured at \$1.25 a thousand, on a basis of a yield of logs averaging 8,000 feet to the acre. The cost of producing the lumber, including cutting and hauling of logs to the mill, sawing and handling, was figured at \$8 a thousand. Adding the cost of stumpage at \$1.25 a thousand, the total cost of the product ready for shipment was \$9.25 a thousand. No interest on the investment was figured in. The average price of lumber when sold was \$11.75 a thousand, and consequently the profit thereon was \$2.50 a thousand. But the management thought that an interest charge on the entire investment in timber, plant and working capital should be deducted from the apparent profits, which would reduce them materially.

Another statement of the cost of southern pine pro-

duction comes from the southeast section and is peculiarly interesting because of its detail and for the reason that its total result so nearly coincides with that in the case of the Mississippi mill. Here it is:

Stumpage per thousand feet.....	\$2.00
Cutting and loading logs.....	2.00
Railroading .....	.50
Insurance .....	.2125
Cash discounts on lumber sales.....	.19
Interest .....	.57
Supplies .....	.38
Labor	2.84
Repairs .....	.26
Oil .....	.095
Salaries .....	.5425
Sundry expenses.....	.22
Taxes .....	.10
Total	<hr/> \$9.91

In this instance the lumber was sold at an average of \$12 a thousand. The interest charge was only on balance due for stumpage purchased; so that the total result in the way of profit, when the interest on investment is considered, in the two cases is rather indeterminate.

But the main value in the two statements and the comparison to be made between them is in the detailed costs of logging, sawing and handling, and in the fact that there is so close a parallel in results as applied to the two instances. These being typical yellow pine operations, anyone not familiar with the southern lumber business can nearly approach a conclusion as to costs and profits in yellow pine production. There will be variations between localities, conditions and management, but it is safe to conclude the average cost of yellow pine lumber ready for shipment throughout the gulf states is not far from \$10 a

thousand (1904) exclusive of interest. Profit should cover interest on investment and a moderate dividend besides. Those who bought their stumpage at 25 to 50 cents an acre stand to win a profit on the timber in any case, and another profit on his manufacturing operations.

Revenue from Sale of Canadian Timber.

What revenue does Canada derive from the sale of its timber?

Each revenue of the Dominion of Canada has jurisdiction over its own timber lands, with possibly some exceptions the timber rights on which crown lands are sold at auction and as natural the value has depreciated very much in recent years. The table of comparison given herewith shows the range of prices, 1868 to 1903, also the number of square miles sold by the province of Ontario for each year mentioned:

DATE—	<i>Square miles.</i>	<i>Highest price per mile.</i>	<i>Av. price per mile.</i>
1868.....	38	\$ 519	\$ 380.17
1869.....	98	418	260.86
1870.....	12	640	640.00
1871.....	487	500	241.62
1872.....	5,031	1,000	117.79
1877.....	375	500	201.97
1881.....	1,379	2,300	532.00
1885.....	1,012	1,250	314.87
1887.....	459	6,300	2,859.00
1890.....	376	2,625	919.06
1892.....	633	17,500	3,657.18
1897.....	159	6,600	1,605.07
1899.....	360	8,500	2,010.00
1901.....	399	4,700	1,835.41
1903.....	826½	31,500	4,449.25

It is a high jump from \$519 as the maximum price per mile in 1868 to \$31,500 as the highest in 1903.

The sales that year were distinguished for yielding the highest average per mile ever realized; that is, \$4,449.25. The next highest was in 1887, when the maximum price per mile was \$2,859. Since 1892 prices have been higher than heretofore except in 1887. The tendency of the "American invasion" will be to induce a vigorous competition from the Canadian side, and thus prices will be maintained at higher figures than in years past.

White Pine Values.

What has been the range of white pine stumpage values?

Prior to the civil war white pine was not sold on the stumpage basis but by the acre and brought anywhere from nothing up to \$1.25. In 1878 it could be purchased anywhere from 50 cents to \$1 a thousand feet, the stumpage estimates being made on a basis which included only the pick of the trees. From that time on there was a steady increase, with the exception of years of panic such as 1893, when stumpage values, in company with everything else, slumped badly. At the present time white pine stumpage has no fixed market value, but is worth whatever the owner can get for it. It may be said to run anywhere from \$3 to \$20 a thousand feet. Quality governs price.

Yellow Pine Timber Values.

There is no question but that we lumber people in the south who own stumpage must in some way look to the preservation of the life of our holdings and get everything possible out of them. If we do not do so this generation will see the end of yellow pine in the south.

Education is a comparative attribute. Many operators in various parts of the country are intimately acquainted with everything having a bearing on their call-

ing, and naturally this acquaintance enables them to handle their affairs in a much more profitable manner than where such knowledge is lacking. The wisdom of today is the ignorance of tomorrow, however, and in order that a manufacturer may keep abreast of the times it is necessary that developments be watched with a jealous eye.

A time will come when the strict economy of the packing establishments will be applied to lumbering operations. At that time even the most economical operators of the present day will rank among the extravagant and wasteful—or rather their methods will. It is the individuals, firms or corporations that can understand and appreciate the trend of events and adapt themselves thereto that will keep step with improvements as they are adopted and which, in the end, will realize the greatest profits from their labors.

Figuring Cost of Manufacture.

What is the proper method to use in arriving at the cost of lumber manufacture?

Probably the best method is for the millman to have a cost sheet which, when all of these questions are answered, will present an itemized statement of every detail of his operations from the time the tree is felled until the lumber has been sold and the purchase price, less the discount, has been received. It should show in addition to the direct operating expenses the percentage of depletion in the value of the plant which must be borne by each thousand feet of lumber product, also of insurance, office expenses (including postage, telegraph and telegram bills) and, of course, salaries, repairs in and around the mill, main line construction, taxes and interest on the money invested.

Frequently manufacturers are prevented from figuring in these important items which go to make up what it costs them to produce their lumber through a desire to economize in the accounting department. This, however, is false economy, as frequently one extra clerk receiving from \$60 to \$75 a month will cause a saving of thousands of dollars because his work will make it possible for the millman to take into account many things which he otherwise would know nothing about. The manufacturer who in figuring his producing cost takes into account only the general items of logging and saw and planing mill expenses is likely to figure on a contract under the impression that he has set a price which will net him a handsome profit, but when the books are balanced at the end of the year he will find that he has sold his product for less than it cost him to get it out.

Financial Rank of Lumber Industry.

How does the lumber trade compare in financial value with other industries in the United States?

According to the United States census report of 1900, lumber and its remanufactures (which does not include carpentry and some other items that might be counted under this head) ranked, in comparison with the three other leading industries, including food and kindred products, textiles, iron and steel and their products, second in number of establishments, third in capital, third in average number of wage-earners, third in total wages paid and fourth in value of products. In 1890 (using the same classifications as in 1900) lumber and its remanufactures ranked second in number of establishments, third in capital, second in average number of wage-earners, third in total wages paid and fourth in value of products. Since 1900, however, the

value of products of the lumber industry has increased considerably.

As illustrations of the amount of money represented by the lumber trade, it may be said that from 1848 to 1890, inclusive, the production of gold in California—the center of the gold mining industry of the United States—was \$1,348,000,000. In 1890 alone the value of the lumber industry, including in that term all of its departments, was approximately \$1,195,000,000, a difference of only \$143,000,000 between the lumber trade of one year and the gold production of forty-three years. In 1895 the value of wheat, oil, gold and iron was \$940,000,000, while the products of the forest were, if anything, in excess of the \$1,135,000,000 quoted as representing the operations of 1890.

WEIGHTS.

Can Manufacturers Be Held Responsible for Weights?

Some time ago we filled an order for square and sound No. 1 common air dried dimension. The order was accepted on f. o. b. mill price, and was shipped according to order with the exception of a small amount which was rejected on account of not being up to grade. Our customer in making his settlement with us charged us with culls, which we accepted, and for which we gave him credit; he also charged us with the difference in freight, figuring on the estimated weights given by the Yellow Pine Manufacturers' Association and the railroad weights as shown on expense bills. There was no agreement whatever as to what the stock would weigh.

Shippers are not obligated to guarantee weight of lumber when sold f. o. b. mill nor to stand sponsor for the official estimates of the association. Had the lumber been sold f. o. b. destination the manufacturer would have figured freight on a basis of the estimated or average weight. In this instance he would have

stood the difference between the estimated and the actual weights and it would have been just as fair and equitable for him to make an additional charge under such circumstances as it is for the buyer to put in a claim for the excess freight. This is true unless the maximum weight had been specified in the contract, which from the statement given does not appear to have been the case.

Schedules of weights issued by the various lumber associations are representative. They doubtless would be found to correspond very nearly with the average weight of lumber of specified kinds and dimensions—some shipments would be lighter and some heavier than the average. The texture and character of any kind of lumber have much to do with its weight, and as no two pieces of wood are exactly the same in appearance a similar diversity of character, in a general way, may be said to apply in regard to weight.

Weights of Michigan Logs and Lumber.

How do Michigan woods compare in weight a thousand feet in the log and in lumber coming from the kiln?

The following log woods are based upon the Doyle scale. Both logs and lumber are for 1,000 feet. The logs considered run ten to the thousand feet.

	<i>Logs, pounds. Lumber.</i>	
Pine	9,000	2,300
Hemlock	9,000	2,500
Beech	12,000	3,741
Hard maple	12,000	3,783
Soft maple	11,000	3,783
Oak, red and white.....	12,000	3,630
Birch, red and white.....	12,000	3,000
Rock elm	12,000	3,613
Soft elm	11,000	3,000
Basswood	11,000	2,350
Cherry	12,000	3,023

Weights of White Pine.

What are the estimated weights of green, half-dry and dry white pine lumber?

Weights of white pine and norway have been very closely ascertained by northern manufacturers. The comparative weights are not estimates, strictly speaking, but are the average of a large number of actual weights. A comparison of green, half-dry and dry lumber is given here:

	<i>Green.</i>	<i>Half dry.</i>	<i>Dry.</i>
2-inch rough or S1E.....	4,000	2,900	2,500
2x14 or S1S1E.....	3,700	3,300	3,000
2-inch, S1S1E, S4S, D. & M.....	3,000	2,500	2,200
3-inch and 4x4 to 8x8.....	4,000	3,500	3,000
Common boards, rough.....	4,000	2,900	2,400
Common boards, S1S or S2S.....	2,900	2,400	2,000
Fencing, rough	4,000	2,900	2,400
Fencing, S1S or S2S.....	2,900	2,400	2,000
Dropped siding, grooved roofing....	2,600	2,200	1,800
Shiplap and D. & M.....	2,600	2,200	1,800
¾-inch lath, norway.....	850	650	500
¾-inch lath, white pine.....	800	600	450
¾-inch ceiling and beveled siding..	...	...	800
Finishing, S1S or S2S.....	...	...	2,000
Sheathing lath .....	...	...	1,500
¾-inch ceiling .....	...	...	1,500
½-inch flat battens .....	...	...	800
Pickets, rough .....	...	...	2,400
Pickets, D. & H.....	...	...	1,400
Shingles .....	...	...	250

This compilation was made by the secretary of the Northern Pine Manufacturers' Association and may be regarded as authoritative.

Weights of Yellow Pine.

Will you kindly give at your early convenience the standard weights of yellow pine manufactured and graded according to standard grades and sizes, and oblige.

The official weights of the Georgia Interstate Saw

Mill Association, adopted January 12, 1904, for yellow pine lumber of all descriptions are as follows:

GEORGIA WEIGHTS.		Wts. per M.
Flooring, 13-16x3¼ face flat back.....	2,250	
Flooring, 13-16x3¼ face hollow back.....	2,050	
Flooring, 13-16x5¼ face flat back.....	2,400	
(All heart face is 150 pounds per M heavier.)		
Ceiling, ¾x3¼ face.....	1,100	
Ceiling, ½x3¼ face.....	1,400	
Ceiling, ¾x3¼ face.....	1,700	
Ceiling, ¾x3¼ face.....	2,000	
Drop siding and molded ceiling from 1-inch stock, finished to 13-16x5¼.....	2,300	
Beveled siding from 1-inch stock.....	1,100	
Beveled siding from 5-4-inch stock.....	1,500	
Square edge weatherboarding from 5-4-inch stock....	1,700	
Molded base 8-in., 10-in. and 12-in. stock.....	2,400	
Finish S 2 S 13-16 from 1-inch stock.....	2,800	
Finish S 2 S 1½ from 5-4-inch stock.....	3,000	
Finish, rough and kiln dried.....	3,800	
Ship-lap D and M from 1-inch stock.....	2,600	
Common boards and fencing S 2 S.....	2,800	
Common boards and fencing, rough and dry.....	3,900	
2x4 and up, rough and green.....	4,500	
2x4 and up, D ¼, scant and green.....	4,000	
2x4 and up, D ¼, scant and dry.....	3,500	
4x6 and up, rough and green.....	4,500	
4x6 and up, D ¼, scant and green.....	4,000	
Rough edge or flitch.....	5,000	
Car sills, rough	4,500	
Car sills, D 4 S ¼ scant.....	4,000	
Car framing, rough	4,500	
Car framing, D 4 S.....	4,000	
Car decking, rough and green.....	4,500	
Car decking, rough and dry.....	3,800	
Car decking D and M, dry.....	3,000	
Sawn Staves, per M pieces, green.....	4,500	
Sawn staves, per M pieces, dry.....	3,800	
Shingles, pine.....	550	
Lath, 1½x¾x4, dry.....	550	
FLORIDA WEIGHTS.		Wt. per M.
Flooring, ¾x2½, 3, 3½-inch face heart.....	2,800	

Flooring, $\frac{7}{8}$ x $2\frac{1}{2}$, x3, $3\frac{1}{2}$ -inch face sap.....	2,450
Flooring, $\frac{7}{8}$ x $5\frac{1}{2}$ -inch sap.....	2,700
Celling, $\frac{1}{2}$ x $2\frac{1}{2}$, 3, $3\frac{1}{2}$ -inch face.....	1,400
Celling, $\frac{5}{8}$ x3-inch face.....	1,700
Celling, $\frac{3}{4}$ x3-inch face.....	2,200
Drop siding from 1-inch stock, $5\frac{1}{2}$ -inch face.....	2,400
Molded base, 1-inch stock.....	2,800
Finish, S 2 S to $\frac{7}{8}$ inch.....	3,000
Finish, S 2 S to 1, $1\frac{1}{2}$ inch.....	3,100
Common boards and fencing, S 1 or 2 S.....	3,100
2x4 and up, rough and green.....	4,500
2x4 and up, S 1 S and 1 E $\frac{1}{4}$ scant.....	4,000
4x4 to 8x8, rough and green.....	4,500
4x4 to 8x8 D 4 S $\frac{1}{4}$ scant.....	4,000
10x10 and up, rough and green.....	4,500
Rough edge or flitch.....	5,000
Car sills, rough.....	4,500
Car sills, D 4 S $\frac{1}{4}$ scant.....	4,000
Car framing, rough.....	4,500
Car framing, D 4 S.....	4,000
Car decking, rough and green.....	4,500
Car decking, rough and dry.....	4,000
Car decking, D and M, dry.....	3,000
Sawn staves, per M pieces, green.....	4,800
Sawn staves, per M pieces, dry.....	4,000
Shingles, pine.....	550
Lath, $1\frac{1}{2}$ x $\frac{3}{8}$ x4, dry.....	550

The difference to be noted between the Georgia and the Florida weights are to a large extent explained by the difference in the size of the material manufactured, as will be seen by comparing the two lists.

STRENGTH.

First Appropriation by Congress for Testing Woods.

What was the first appropriation made by Congress for the testing of the strength of woods?

April 1, 1902, Senator A. G. Foster, of Washington, introduced a bill providing for an appropriation of

\$40,000 to be used in the testing of various American woods, 30 percent of this sum to be devoted to the testing of Douglas fir and other Pacific coast timber. Since that time the government, working through the Forest Service, has made a great number of tests of the different species of North American woods not only in regard to their comparative strengths but to their longevity under different circumstances and the various other qualities which give them commercial value.

Strengths of Oaks.

What are the commercial oaks and how do they compare in breaking strengths?

The following table shows the oaks indigenous to the six producing countries, with their respective breaking strengths. In the tests from which these figures were obtained pieces one inch square and 12 inches long were used. They were supported at the ends and weighted in the middle.

African oak.....	835 pounds	Dantzic oak.....	513 pounds
English oak.....	591 pounds	American oak....	487 pounds
Canadian oak.....	580 pounds	Adriatic oak.....	460 pounds

Effect of Moisture on Strength.

Is it possible to thoroughly dry lumber, and what is the difference in strength between such dry wood and the same wood when green or water soaked?

Practically speaking, it is impossible to get lumber that is absolutely dry, but thoroughly kiln dried material contains only between 5 and 6 percent of moisture. The difference in strength between lumber that is water soaked and that which is absolutely dry is great. At the Louisiana Purchase Exposition, held at St. Louis, Mo., in 1904, yellow pine was tested to

ascertain the difference in strength between green and dry and water soaked lumber. The results of these tests are shown in the following figures:

DEGREE OF DRYNESS.	Percent of moisture based on dry weight.	Modulus of rupture in pounds, per square inch.
Water soaked	63.3	6,720
Green	21.5	7,260
Fairly dry	13.2	8,380
Dry	11.0	10,630
Very dry	10.2	11,650
Kiln dried	5.6	15,240

These figures are self explanatory. Briefly, laying fractions aside, they show that kiln dried timber is nearly two and a half times stronger than that of like dimensions that is water soaked, and 50 percent stronger than that which is called dry. When it is very dry its strength is increased nearly 35 percent by putting it through the dry kiln.

Tests were made with three yellow pine sticks, 2x2 inches, 3½ feet long, with the following results:

No. 1, very green, broke with modulus of rupture at 8,764 pounds a square inch.

No. 2, dry, broke at 11,510 pounds a square inch.

No. 3, very dry, broke at 12,940 pounds a square inch.

It will be observed that the percentages do not vary particularly from those shown in the table. Although these tests were with yellow pine it is said that the law holds good with other woods.

From these figures it may be learned that when estimating the strength of wood its degree of dryness should be taken into consideration, as a green stick placed where the strength is based on a dry one would break. On the other hand, we are taught that when

green timbers will support the required weight the longer the frame stands the stronger it will become up to the point where the timber becomes thoroughly dry.

Comparative Strength of Fir and Yellow Pine.

Give a comparison of the strength of Douglas fir and longleaf and shortleaf pine.

The following summary of tests is credited to the Forest Service. They are not accepted without question by operators who claim an injustice is done longleaf yellow pine:

	<i>Fibrous strength at elastic point.</i>	<i>Modulus of rupture.</i>	<i>Modulus of elasticity.</i>
Oregon fir	6,190	8,594	1,917
Longleaf yellow pine.....	5,581	8,384	1,820
Shortleaf yellow pine.....	3,089	4,874	1,164

Shrinkage of Lumber.

Does lumber shrink lengthwise, and, if so, is such shrinkage greater in redwood than in other woods?

All lumber shrinks lengthwise, but the shrinkage is light as compared with transverse shrinkage. There is not a marked difference between the lengthwise shrinkage of northern woods and those of the south and the Pacific coast. Experiments made on various species showed the average longitudinal shrinkage was less than .16 percent. Pine shows a shrinkage of .065 percent, oak .085 percent, chestnut .16 percent, redwood .141 percent and Douglas fir .126 percent. The shrinkage in redwood does not appear to be uniform, although, according to tests of this wood from dead green to bone dry, made at the University of California in 1898, the percentage was only .0695 percent. To simplify the above percentages it may be stated

that one-tenth of 1 percent would be equivalent to .192 of an inch, or practically one-fifth of an inch in the length of a 16-foot board. For years it was believed that redwood showed a greater endwise shrinkage than any other wood. This was due probably to the fact that the wood was shipped out too green and the consignees noted a very material shrinkage which, however, would occur in any other wood shipped in the same condition.

Comparative Strength of Douglas Fir and White Pine.

What are the comparative strength of Douglas fir and white pine?

According to exhaustive tests Douglas fir averages considerably above white pine. The following figures show the comparative strength of the two woods as ascertained by their resistance to varying pressures. The first figures are for white pine and the second for Douglas fir in each instance:

Apparent elasticity in pounds per square inch	6,400	6,400
Ultimate strength	7,900	7,900
Modulus of elasticity.....	1,390,000	1,680,000
Crushing endwise	5,400	5,700
Crushing across grain.....	700	800
Shearing along the grain.....	400	500
Average of all tests.....	5,400	5,700

The above figures are taken from Johnson's "The Materials of Construction."

Pine, Fir and Hemlock Compared.

How do red fir, western hemlock, North Carolina loblolly pine and longleaf pine compare as structural materials?

The following table was made up from reports of tests from the Forest Service which were made in 1904:

SPECIES.	Grade.	Average number of sticks.	Time seasoned.	Moisture.	Weight, cubic foot.		Modulus of rupture.	Modulus of elasticity.
					As tested.	Dry.		
Red fir— Shipments A and C.....	Select.....	22	6 to 12	32.6	37.1	30.2	8,810	1,925
	Merchantable..	29	6 to 12	26.8	34.5	28.4	7,780	1,825
	Seconds	16	6 to 12	19.5	31.9	26.7	6,390	1,630
Shipment B.....	Select.....	14	3	37.6	30.9	24.2	6,260	1,290
	Merchantable..	15	3	26.5	33.7	26.6	5,340	1,220
	Seconds	25	3	26.2	35.1	27.8	4,280	1,400
Shipments A, B and C.....	Select.....	36	.....	24.5	34.7	27.9	7,780	1,675
	Merchantable..	44	.....	22.7	34.8	28.4	6,920	1,860
	Seconds	41	.....	23.6	33.8	27.4	5,070	1,400
Average of ship- ments A, B and C.....	All grades	121	.....	23.6	33.4	27.8	6,680	1,570
	do	30	3 to 6	32.2	35.4	26.8	5,565	1,290
North Carolina lob- lolly pine	Square edge ..	20	3	37.2	42.8	31.2	6,187	1,479
	Merchantable..	26	6 to 12	26.7	53.3	42.1	8,210	1,790
Longleaf pine								

Larch or Tamarack of Minnesota.

Of late we understand a large percentage of piece stuff sent out by northern pine manufacturers is tamarack. Will you kindly give us an idea of the character of this wood?

In regard to tamarack of the old northwest, the Forest Service has this to say:

We have no hesitation in saying that northern tamarack lumber is distinctly more durable when exposed in the soil or to the weather than either norway pine or hemlock. In fact, so far as our knowledge goes, it rates about with bald cypress in that respect. As to strength we know very little, because no direct tests have been made, and the wood is rarely used except for posts, poles, ship knees and similar purposes; that is, those requiring durability.

In regard to strength, weight etc. the following table shows the relative characteristics of larch (tamarack) and certain other well known woods:

WOODS—	Weight.	<i>Resistance</i> <i>Transverse to endwise</i>		
		<i>strength.</i>	<i>crushing.</i>	<i>Hardness.</i>
Tamarack, eastern....	6,236	384	8,763	1,615
Tamarack, western....	7,407	524	11,023	2,395
White pine	3,854	267	6,219	1,194
Norway pine	4,854	341	7,274	1,353
Hemlock	4,239	307	6,142	1,314
Shortleaf yellow pine.	6,104	443	7,628	2,064
Longleaf yellow pine..	6,990	490	10,074	2,508
Cypress	4,543	291	6,771	1,166
Douglas fir	5,157	376	8,289	1,608
Noble fir	4,561	368	7,256	1,917

Strength of Tamarack and Norway Pine.

Please give the comparative strength of tamarack and norway pine.

The forest service has issued a bulletin giving the results of a number of tests made recently at Purdue University, Lafayette, Ind. These experiments were made with green tamarack and green norway pine secured from St. Louis county, Minnesota. The strength values as de-

terminated by these tests are said to apply only approximately to some species grown elsewhere. Bending tests were made with beams covering a span of 13 feet 6 inches, the piece used ranging in size from 4x10 to 6x12. These tests resulted in the following average:

	—Pounds per square inch.—	
	<i>Tamarack.</i>	<i>Norway pine.</i>
Strength, modulus of rupture....	4,600	4,000
Stiffness, modulus of elasticity...	1,240,000	1,189,000

According to these tests green tamarack showed to better advantage than green norway. Dry tamarack weighs about twenty-nine pounds a cubic foot and norway pine about twenty-four pounds. Tamarack usually is slower of growth than pine and tests with small clear pieces indicated that the strength decreases when the rate of growth is faster than one inch in eight years. A similar decrease takes place in norway pine when the rate of growth is more than one inch in ten years.

Comparative Strength of Longleaf and Shortleaf Pine.

Which is the stronger, longleaf or shortleaf yellow pine?

Longleaf pine is stronger than shortleaf in every respect. In transverse strain the pressure borne by longleaf pine is 490 pounds as against 443 for the shortleaf. Their relative strength in endwise crushing is represented by 10,074 pounds against 7,628.

Strength of Oak, Pine and Fir.

What is the comparative strength of oak, pine and Pacific coast fir?

The following table of tests shows the weight required to break these woods across the grain. The pieces used in the test were all small, about 1½ inches square and about 3 feet long, and some variation is

shown in the results obtained compared with those from tests based on timber of commercial sizes. However, it may be said that white oak, red oak, longleaf yellow pine and Douglas fir are of about equal strength and durability:

WOOD—	No. of Tests.	Ultimate Transverse Strength.
White oak (<i>Quercus alba</i>).....	37	386
Red oak (<i>Quercus rubra</i>).....	20	422
White pine (<i>Pinus strobus</i>), of Michigan...	13	267
White pine (<i>Pinus monticola</i>), of Idaho...	3	260
Norway pine (<i>Pinus resinosa</i>).....	8	341
Western yellow pine (<i>Pinus ponderosa</i>)....	13	307
Shortleaf yellow pine (<i>Pinus echinata</i>)....	3	443
Longleaf yellow pine (<i>Pinus palustris</i>)....	27	490
Red fir (<i>Pseudotsuga douglasii</i>), of Oregon and Washington	26	376

Comparative Strengths of North Carolina Pine and Longleaf Pine.

Is North Carolina pine as strong as longleaf yellow pine?

North Carolina pine, or loblolly, as it is more commonly known, is not as strong as either longleaf or shortleaf yellow pine, but ranks well among structural woods. Loblolly is about as inferior to shortleaf pine as shortleaf is to longleaf. It is, however, stronger than spruce, hemlock or white pine.

Shrinkage of Quarter Sawed Lumber.

Which edge of a quarter sawed board will shrink the more, the inner or heart edge, or the outer or sap edge?

Unquestionably the sap edge, and this is equally true in regard to swelling. The explanation is that in most if not all exogenous woods it is the bundles of wood cell fiber which make up the sap ducts which shrink, and these are more numerous in the outer lay-

ets of the tree. The medullary rays do not shrink at all and these do not bind the layers of wood fiber near the trunk as closely as they do the heart or central section of the tree. A board cut from an oak tree, from back to back through the heart, will be found to shrink at both edges to such a degree that it will become convex.

Change in Quality of Yellow Pine.

Has the quality of yellow pine going to northern markets deteriorated?

Within the last few years a great change has taken place in yellow pine shipments to northern markets. As is the case in the introduction of any new wood at first only the very best was sent, and nothing but clear reached Chicago and other markets in that territory. Now, however, No. 2 common and even No. 3 common are sold there. This change, which is a natural one, has brought other changes. In the old days only the very best trees were cut, the others being left standing, or if the logs were cut they were left on the ground, or if they did get to the mill they went to the refuse burner. Now a tract is cut clean, even the once despised "redheart" being taken. This has had the effect of causing a material raise in stumpage values.

Strength of Woods.

What are the relative strengths of northern and southern grown timber?

Much information along this line can be obtained by asking the Forest Service of the department of agriculture, at Washington, D. C., for its circular devoted to this subject, and in which will be found tables giving the results of elaborate tests as to the strength of woods.

The following table is reproduced from a circular compiled by Prof. J. B. Johnson and printed in his work, "The Materials of Construction." The first number after the name of the wood represents the apparent elastic limit under a cross bending test, the second the ultimate strength under the same conditions and the third the resistance to end pressure. That is to say, the first two represent the value of the woods for beams, joists etc., and the third for posts, pins, piles etc.

Longleaf pine	10,000	12,000	8,000
Shortleaf pine	7,800	10,100	6,500
Loblolly pine	9,200	11,300	7,400
White pine	6,400	7,900	5,400
Cypress	6,600	7,900	6,000
White cedar	5,800	6,300	5,200
White oak	9,600	13,100	8,500
Red oak	9,200	11,400	7,200
Water oak	8,800	12,400	7,800
Shagbark hickory	11,200	16,000	9,500
Pecan hickory	11,600	15,300	9,100
Pignut hickory	12,600	18,700	10,900
White elm	7,300	1,300	7,200

Experiments are now being carried on at several universities under the supervision of the Forest Service and the trade at large will watch with considerable interest the results of these tests.

PART VIII.—THE TRADE.

TRADE PAPERS.

Oldest Subscriber of the American Lumberman.

Who is the oldest subscriber to the AMERICAN LUMBERMAN?

James I. Younglove, of Johnstown, N. Y., first subscribed for the *Michigan Lumberman* in 1871. The *Michigan Lumberman* was succeeded in 1873 by the *Northwestern Lumberman*, which was merged into the AMERICAN LUMBERMAN January 1, 1899. Mr. Younglove still is (1906) subscribing to the AMERICAN LUMBERMAN.

First Trade Paper.

What was the first paper published in the interests of the lumber trade?

The *Lumberman's Advertiser*, a weekly paper, published in 1858, is believed to have been the first publication issued exclusively in the interests of the trade. It was gotten out by Nathaniel A. Haven, who in 1858 was secretary of the lumberman's board of trade, the office being at the corner of Randolph and Market streets, Chicago. The paper was printed for Mr. Haven by two Englishmen named Cockcroft and Hampson for \$6 a week, Mr. Haven furnishing the paper. The subscription was \$1 a year and about six lumber concerns carried advertisements in it, for which they paid from \$16 to \$20 each. When the civil war broke out the

English printers left town and that was the last of the *Lumberman's Advertiser*.

Functions of Trade Newspapers.

I am grateful for your kind treatment of my letter. Your action is appreciated. Another trade journal replied to the same letter as follows:

"What is your connection with the deal? Is there anything we can divide if we can work up a trade? I do not know how you feel, but I want some sort of remuneration for any valuable information I turn loose."

This letter with yours I am sending to my English friends—they can see the difference in the persons.

To supply information to its readers and patrons is, from our viewpoint, the duty of all newspapers. The *AMERICAN LUMBERMAN*, in so far as it is able, endeavors to answer fairly and impartially every inquiry that comes to it and for the information of its subscribers at large prints an abstract of the answers given. It frequently happens that it is impossible to give a satisfactory reply, in which case the editor endeavors to supply whatever data can be obtained. It should be borne in mind by those who ask for an opinion relative to trade rules and regulations that the lumber industry is not conducted on rigid rules and that customs and practices vary with locality and for this reason apparent discrepancies are shown in the nature of the answers given. This explanation is called forth by the communication given above in which reference is made to the manner of treatment accorded by the editor of a publication with whose identity the *LUMBERMAN* is not acquainted.

In dealing with matters pertaining to trade ethics and trade practices the publisher of a trade journal has no more right to come to an understanding with an inquirer and seek to settle whatever problem is

brought to his attention in a manner favorable to one party or the other than has the judge of a court to render a decision in the same manner. It is true that the influence of any such publication making a practice of such methods is of a negative character and it probably is owing to this very fact that its voice is impotent.

THE TRADE MARK.

Hoo-Hoo Insignia a Trade-Mark.

Could an individual, firm or corporation use the Hoo-Hoo insignia—black cat standing in a circle—for a trade-mark?

The black cat rampant, in a circle, is a copyrighted emblem the title to which is held by the Order of Hoo-Hoo and consequently its use in the manner suggested would be an infringement and the party so using it would be amenable to law. It has been done, however, for in 1899 Thomas Jackson & Co., of Saginaw, Mich., exporters of doors, attempted to use this emblem as a trade-mark on their exports to England, they being in ignorance of the above limitations of its use. It is employed by several concerns regardless of the well known limitation of its use.

Use of Trade-Mark.

Is it advisable for a lumber manufacturer to use a trade-mark?

The use of the trade-mark is good business policy on the part of the manufacturer of any kind of goods, of lumber as much as any other. The trade-mark soon comes to represent the goods with the consumer and with quality once established on this plan the buyer is willing to pay a little more money if neces-

sary for the product which bears that particular mark, because he feels sure of what he is getting. In selling for export this is particularly true for the buyer may know absolutely nothing of the manufacturer. If, however, he has become educated to the fact that a certain trade-mark stands for high quality it is very natural that he will make a special effort to obtain the goods which come to his market under that brand.

Trade-Mark Registration Abroad.

Is it necessary to register trade-marks in foreign countries in order to secure protection?

Yes. Frequently attention has again been called to the importance of American manufacturers registering their trade-marks abroad. It will come as a surprise to many who are manufacturers and owners of trade-marks and have an extensive foreign trade to learn that in certain countries abroad any resident there may apply for and secure by registration a trade-mark which he may have noticed in use in connection with articles imported into that country and which is not registered. By securing the registration of such trade-mark in his own name he practically stops the original manufacturer and his agents from dealing with such articles bearing the registered trade-mark. In some countries the manufacturer has the chance of establishing his right to a trade-mark by proving that he was the original user thereof, but the expense involved in taking such proceedings becomes a serious consideration. Some manufacturers have preferred to register a new mark, thereby losing the benefits that go with a trade-mark that may have been used and extensively advertised for a number of years, and should

the person who has pirated the trade-mark apply or use it in connection with goods of inferior quality it tends to lower people's idea of the standard qualities produced by such firm and is otherwise detrimental:

The Trade Mark As An Ad.

Is the use of a trade mark or brand advisable?

Where a manufacturer is turning out goods which he knows are of quality to uphold the claims he makes for them a trade mark or brand certainly has a considerable advertising value and this value constantly increases with the length of time the trade mark has been in use. It is equally true, however, that if his goods do not bear out the claims he makes for them that this brand or trade mark will advertise them just the same, but to his disadvantage. When a man buys a new kind of goods which bears the name of its maker, he feels, in the first place, that it must be pretty good or the manufacturer would not risk his reputation on it, and, in the second place, that if it should not prove to be as represented he will be able to fall back on the manufacturer. This latter consideration, especially, keeps the name in his mind and if he has no fault to find with what he has purchased, naturally he will buy the same kind again.

TRADE TERMS.

Tie Plug.

What is a tie plug?

A tie plug is a piece of hardwood $4\frac{1}{2}$ inches long and $\frac{5}{8}$ inches square which is used to fill the hole left by drawing the spike from the railway tie when the

rails are shifted or ties are changed from the main to a side track. In some kinds of wood the hole does not close after the withdrawal of the spike and these plugs are therefore used to preserve the life of the tie.

Mill Culls.

What was the origin of the term "mill culls"?

In the old saw milling days this class of lumber went to the manufacturer in lieu of a saw bill, thereby deriving the name of mill culls. At the close of the war good mill culls were worth about \$2.50 a thousand. As the value of culls increased paying saw bills in this manner began to be too expensive and therefore the plan of paying by the thousand was inaugurated.

Exogenous and Endogenous Defined.

What are the meanings of the words oxogenous and endogenous as applied to trees?

Timber and grass are divided into these two great classes. In the first, oxogenous, are embraced practically all the woods used for structural purposes, while the indogenous growths include the palms, canes, bamboo, grass and the yucca tree.

In exogenous wood the growth takes place upon the outside of the growth made in the previous year and is known as the annual ring. Formerly it was supposed that each ring of wood represented a year in the life of the tree, but it is now contended by some foresters that the climate in which the tree develops has a great deal to do with the period in which these rings are formed and that in the tropics a ring may represent the growth of only two or three months. This exogenous growth may be said to be

a growth which is formed in layers encircling the layer formed during the previous season of growth.

In the trees and grasses included in the endogenous class the growth is formed from within, the new cells mingling with the old growth and forcing themselves outward.

As a natural result of these two natural methods of accretion exogenous wood is more dense in the middle of the tree (the heartwood) than near the circumference (the sap wood) while in the case of the endogenous the cells are crowded together much more closely at the circumference than in the interior of the body.

Vertical Grain.

We would like to know whether the term "vertical grained red oak" is one which is in common use among lumbermen and factories, or whether it is a local term used in some parts of the country? We would also like to know whether this term "vertical grained red oak" means plain red oak or quarter sawed red oak.

The term "vertical" grain or grained, as applied to lumber means the opposite of flat grain. A vertical grain in lumber is secured by quarter sawing. The terms quarter sawed, rift sawed, edge grained and vertical grained are one and the same thing. When one speaks of vertical grained red oak he means quarter sawed red oak or should mean that if he knows what he is talking about. The term "vertical grained" is not universal, and is more or less local in use. In some markets it is used, while in others quarter sawed or rift sawed is the preferred term. "Edge grain" is often used in the south and central market territory in defining the character of yellow pine lumber in place of vertical, quarter sawed or rift sawed. Any one of the four names is admissible, for

all are well understood in the general market. In no case can any one of them be applied to flat or bastard grained lumber. One might as well talk of horizontal perpendicular upright as to call flat grained red oak, or any other flat grained lumber, "vertical grained."

O. G. Defined.

Where did the term "O. G." originate and what do these letters represent?

"O. G." is a term generally used to signify an architectural line. It is descriptive of a double or reverse curve formed by a concave-convex line. It is used to define moldings, roofs, arches or any other parts of buildings where the architect desires to employ this style of lines. The term "O. G." is a contraction of the word "Ogee," derived from the Latin *augrie*, meaning a support. It designates one of the most widely used moldings manufactured and nearly every article of furniture or millwork uses reversed curved lines.

Tapped Timber.

Recently we received a quotation on lumber cut from the tapped timber. Will you kindly enlighten us as to what this term signifies?

In the southeastern part of the country a great deal of the yellow pine timber is tapped for its sap and afterwards cut into lumber, hence giving rise to the term "tapped" timber or lumber.

Wooded and Timbered Areas.

Is there a distinction between the terms, wooded land and forest land?

There is. Wooded land is generally understood to include all lands covered by tree growth of any stage

of development, also land once forested but which has been denuded of all merchantable timber. Forest land is land which contains trees suitable for manufacture for commercial uses.

"For Sale by the Candle."

What is the meaning of the term "for sale by the candle"?

This phrase pertains to an old time method of auctioning in England. When a certain lot of goods was put up for sale, a bit of candle was lighted, its length depending upon the importance of the transaction. As long as the candle burned bids were in order, but as soon as the flame died out the lot was knocked down to whoever had offered the highest price during the time the candle was burning.

"Mill Culls," "Dead Culls."

In a Michigan transaction A lets B a job for putting in logs at \$2.50 a thousand, lumber scale, mill run. In settling B demands pay for scoots, dead culls. Can he collect? What is the difference between mill culls and scoots and dead culls as accepted by the trade?

A court probably would hold that it would be unjust and unreasonable to require a mill owner to pay for something that had no marketable value. If this timber was white pine the scoots were without value.

In northern pine circles there is no practical difference between mill culls and scoots. Mill culls was a term used to describe that part of the product which could not be shipped but which might be sold locally. Scoots represent that portion too poor for any use which usually was burned. Since the No. 3, No. 4 and No. 5 grades of boards have been evolved the

terms "mill culls" and "scoots" have become practically synonymous.

Spring of the Root.

A sells B a piece of standing timber, B to have the right to cut all trees ten inches in diameter at the spring of the root. What would be the spring of the root?

Much would depend upon the kind of timber and the locality in which it grew. In New York on average timber it would be nearer the ground than on the Pacific coast or the cypress or hardwood districts of the south. The spring of the root or the spread of the root marks that point where the roots branch out to form the base of the tree. Nature, after a fashion, has built the foundation on which the tree is to rest and this foundation is broader than the structure. With some exceptions it may be described as the point where the even taper of the bole terminates or merges into the visible spread of the underground growth.

Construing this contract in a practical way it would mean that B would have the right to cut all trees ten inches in diameter at the point where they are severed from the soil with the provision that the tree should be cut as close to the ground as is usual and possible and the diameter at the point where they are severed should mark the "spring of the root."

"Net Freight Measure."

What is the meaning of the term "net freight measure"?

This term covers the deductions from nominal sizes made by shippers to allow for the waste in dressing. Now that lumber is shipped largely by weight this method of measurement is not employed generally.

The following table gives the exact percentage to be deducted from each size, from 1 and $1\frac{1}{4} \times 3$ to 12,

calculating the waste as $\frac{1}{8}$ -inch in the thickness and $\frac{1}{2}$ in the width, and will be useful as a short method or for verifying results obtained otherwise:

<i>Sizes.</i>	<i>Deduct percent.</i>	<i>Sizes.</i>	<i>Deduct percent.</i>
1x 3.....	27.08	1 $\frac{1}{4}$ x 3.....	25.00
1x 4.....	23.44	1 $\frac{1}{4}$ x 4.....	21.25
1x 5.....	21.25	1 $\frac{1}{4}$ x 5.....	19.00
1x 6.....	19.79	1 $\frac{1}{4}$ x 6.....	17.50
1x 7.....	18.75	1 $\frac{1}{4}$ x 7.....	16.43
1x 8.....	17.97	1 $\frac{1}{4}$ x 8.....	15.63
1x 9.....	17.36	1 $\frac{1}{4}$ x 9.....	15.00
1x10.....	16.87	1 $\frac{1}{4}$ x10.....	14.50
1x12.....	16.15	1 $\frac{1}{4}$ x12.....	13.75

By referring to this table it will be seen that the waste in 1x6 is nearly one-fifth, or 20 percent, the exact amount being 19.79, but it will also be seen that this proportion is not fair for any other size. A half-inch taken from a 3-inch board is a much greater proportionate loss than a half-inch taken from a 12-inch board, and vice versa.

PART IX.—FINANCIAL.

Basis of Figuring Sales Commission.

Where lumber is sold and it is understood that the salesman is to receive a commission of 5 percent is he entitled to figure the 5 percent commission on the delivered price or the price f. o. b. mill?

The commission in this case would be figured in the same way as a discount for cash on the price f. o. b. mill. The salesman certainly is not entitled to any commission on freight paid by the consignor.

Collections by Salesmen.

Has the experiment ever been made of placing claims for collection in the hands of salesmen who operate in the territory of the debtors?

There are instances where this has been done very successfully, but it all depends, of course, upon the amount and the man to whom the accounts are given. It is rather a difficult role for a salesman to play.

Discount on Freight.

Where lumber is shipped at a delivered price is it ever allowable to take off an agreed 2 percent discount before the freight is deducted?

The freight is always deducted first and the discount applies only to the mill price of the shipment. Inasmuch as the shipper has to pay out in cash the amount charged as freight it would be unfair to take off from this cash outlay the same discount which applies to the price of the goods sold.

As to Discounts.

What does 2 percent off for cash mean if the purchaser insists upon the discount even though the bill is not paid until the expiration of the credit limit?

The usual term is 2 percent off for cash in ten days, that period being figured as the time necessary to make shipment. The credit limit is usually sixty to ninety days. On a ninety-day sale, 2 percent in ten days means that the seller is paying 2 percent for the use of the money for the maximum period of eighty days. This would be about 9 percent, which probably is more than the money is worth, but the seller offers this inducement in order that he may keep his accounts closed up in good shape. If, however, the purchaser waits sixty days before remitting on the bill, it means that the seller is paying him a rate of interest for the use of the money for the remaining thirty days of 24 percent, which of course is beyond all reason. The first figures are based upon the supposition that the buyer takes advantage of the full time limit for the payment of the account. It is easily seen, therefore, that the practice of insisting upon the 2 percent discount after the passage of the ten-day period is wholly inadequate, though the seller often allows himself to be taken advantage of in this manner rather than risk losing a customer who may be a good one in all other respects.

Chicago Discounts.

What is the Chicago lumber discount?

Discounts in Chicago vary to some extent, but as a rule $1\frac{1}{2}$ percent is allowed on payments made on or before the tenth of the month succeeding the month when the purchase was made. On country shipments

the rule is 2 percent for payments made within ten days from date of invoice.

As to Deducting Freight Before Figuring Discount.

Is there any authority of the higher courts covering the question of deducting freight from the invoice before figuring cash discount?

As far as can be learned there is no decision covering this point, and it is extremely improbable that there ever will be. In the first place, the amount contested for necessarily would be very small, and in the second the custom of deducting freight from the face of the invoice before figuring the discount is so well established as to have become in fact common law.

Legal Cancellation of Debt.

Are there any circumstances under which the payment of less than the full amount due constitutes the legal cancelling of a debt?

The general rule of the courts is that no debt can be settled by payment of less than the full amount due. But exceptions are made to this rule. For example, when payment is made before it is due or at a place more advantageous to the creditor. In all cases a receipt should be made to read, "Paid in full of" (whatever the amount happens to be), instead of "Paid in full."

Certified Checks.

What does certification of a check by a bank mean?

In law and in popular theory it means that the bank certifies that the maker of the check has the amount appearing on the face thereof to his credit in that institution and that the same has been set aside for the

payment of that particular piece of commercial paper. It is a practice which has become quite general in large commercial centers, however, that certification of checks by banks simply means that those banks are indorsing the checks and relying upon their customers to make good the amounts.

Postal Card Quotations.

Is the practice of sending out postal card price lists advantageous to the manufacturer?

The custom of sending out postal card price lists has been generally condemned by the retail trade in almost all sections of the country and as they are the ones to whom they are directed and the ones from whom results must come if there are any, it would seem that the postal card list would not be a business gatherer. Retailers complain that open price lists of this description are likely to get into the hands of their customers. The man who buys the lumber and who knows nothing of the expenses and loss incident to the retail trade sees only the difference between the wholesale and retail prices and is likely to think he is getting very much the worst of it, which is a detriment to the retailer's trade. Beside this positive objection it is doubtful if the postal card or open communication is a success from the fact that a great majority of business men consign this class of communications to the waste paper basket without reading them. A sealed letter costs a little more in postage but it gets much more business and as getting business is the sole object of sending out price lists it would seem to be a plain case of the advantage lying with the sealed communication from the standpoint both of the manufacturer and the yard man.

Attitude Toward Bankrupts.

What attitude should business men adopt toward bankrupts who seek to reënter the business field?

Bankrupts may be divided roughly into three classes, the first being made up of those who fail because of unfortuitous circumstances such as panics, crop failures, failures of other concerns etc. The second class of bankrupts are those who have become such through inability to push their business or to finance it properly, and lastly the men who have gone into bankruptcy for what there was in it. The treatment by business men of bankrupts who are seeking to reëstablish themselves in the commercial world, it would seem, should vary according to the class in which the applicant is placed, and class should be determined. If in the first there is no reason why he should not be received cordially and extended all the possible assistance in the furtherance of his laudable efforts. If a man has made a business failure because he is lacking in business instinct or business ability, the probabilities are strong that his second attempt will result no better than the first and his account, if one is extended to him, should be a modest one and carefully watched. A man who engages in business with the premeditated intention of making a lucrative failure should be considered a business pirate and treated accordingly. These people, many of them, are like the fisherman who used a worm to catch a minnow, a minnow to catch a perch and a perch to catch a bass. They are likely to use the money made out of the first fraudulent deal, buy for cash until they have established themselves in the confidence of the men they are trading with and then to repeat their business somersault, only on a larger scale.

Don't Cut the Price.

Does it pay to cut prices?

Hamlet Up to Date.

To cut, or not to cut—that is the question.
 Whether 'tis better in the end
 To let the chap who knows not the worth
 Have the work at cutthroat price, or,
 To take up arms against his competition,
 And, by opposing cut for cut, end it.
 To cut—and by cutting put the other cutter
 Out of business—'tis a consummation
 Devoutly to be wish'd. To cut—to slash—
 Perchance myself to get it in the neck—
 Ay, there's the rub; for when one starts
 To meet the other fellow's price 'tis like as not
 He'll find he's up against it good and hard.
 To cut and slash is not to end the confusion
 And the many evils the trade is pestered with;
 Nay, nay, Pauline; 'tis but the forerunner
 Of debt and mortgage such course portends.
 'Tis well to get the price the work is worth
 And not be bullied into doing it
 For what Soandso will do it for.
 Methinks I'll make the customer understand
 My work is It, the only It worth having;
 And, having him on the string,
 I'll clinch the argument with fine specimens;
 Thus will I gather good business.
 Price cutting doth appear unseemly
 And fit only for the man who knows not
 What his work is worth, and who, ere long,
 By very stress of making vain comparison
 'Twixt bank account and liabilities,
 Will make his exit from the business.

Relative Importance of Buying and Selling Departments.

Is the buying or the selling department the more important?

It is probable that these two ends of the business are equally important to its successful conduct. While most people look upon the selling of a commodity as the more difficult, it is a true saying that what is well bought is half sold. It is just as important that a concern should stand well with those from whom it is buying its supplies as that its reputation should be above reproach with its patrons. A successful buyer not only should be able to judge accurately the value of goods offered him but should be approachable—not above looking at any man's goods or talking with any salesman and at all times holding himself in readiness to consider possible advantageous purchases.

Two Percent Ten days.

December 9, 1904, A requested B to make delivered prices on a specified amount of yellow pine lumber. Quotations were made December 12, which were accepted by wire, the telegram giving the order being confirmed December 23. In addition to specifically setting forth the character of the lumber desired, the order contained a memorandum to the effect that quick shipment was to be made and that the terms were to be "Two percent ten days." Invoice bore date December 30 and presumably the car containing the lumber was tendered to the railroad company for transportation on that day. The record of this shipment shows that the lumber was unloaded February 6. Nothing is said relative to the date on which the car was placed for unloading.

In accordance with the buyer's understanding of the terms on which the material had been bought, within ten days of the date of unloading settlement was made, by deducting the freight, discounting the balance at 2 percent and remitting check to cover the remainder. This settlement did not meet the approval of the shipper and check was returned with the request that inasmuch as discount period had elapsed the face value of the check should correspond with the amount specified in the invoice after deducting freight charges. This was met by a counterclaim on the part of the buyer that the terms in the original order made the bill subject to a discount and that the discount period did not begin until the day the car was placed on the public siding for unloading.

So far as I am able to ascertain the controversy involves one point only, which I consider to be a correct definition of the date from which the discount period is to be computed. It devolves upon me to define this point.

Purchaser places great reliance in the fact that the terms of the order accepted and filled by the shipper read "Two percent ten days." I do not deem the fact that purchaser had been given such terms evidence sufficient to establish a custom. It possibly is true that a discount of 2 percent had been allowed purchaser if remittance was made within ten days of arrival of the car. This privilege perhaps has been enjoyed so long that it has been construed to be a custom widespread in its application. I cannot, however, agree with this understanding of the basis on which a discount, an inducement for prompt settlement, is given. On the contrary the history of discounting bills shows that the ten-day limit has ever been computed from the date of the invoice, which

should be coincident with the date the shipment is tendered to the railroad company for transportation.

This position is supported and I believe amply justified by the fact that in all branches of trade, so far as I am aware, and in all departments of the lumber business of the central and eastern states, a discount is offered providing payment is made within a specified time from the date of the invoice. I have been unable to find a single instance among central and eastern lumbermen where a letterhead or invoice form provides for a discount within a specified time after the material is received.

It is contended by the purchaser that discount should be allowed because in similar transactions in the past it had been. It seems to be, however, that sellers have never sanctioned this practice; rather they have tolerated it and have "allowed" the buyer to profit by discount even when nothing was said in the contract relative thereto and in spite of the fact that in many instances the invoice provided in plain terms that the discount period was to begin from date of shipment.

It must be admitted that the terms of discount provided by lumber manufacturers and wholesalers have been leniently construed, and I am aware that in many instances a discount has been taken and no objections raised, although the terms on which it was offered had not been observed. It cannot be held, however, that because a principle has been violated—not infrequently, it must be admitted, with the tacit consent of the seller—such acts can be construed as a justification of the violation or as tending to establish an authoritative precedent. It may be that a new and almost universal change is in progress; but if so I am inclined to believe it will be toward a stricter en-

forcement of the provisions governing the sale and not that a more lenient interpretation will be sanctioned. A law must be regarded as authoritative until it has been repealed and it must be held as the standard until some other has been provided.

I would call especial attention and place particular emphasis upon the indefinite nature of the terms contained in the order given by A. The law provides that any contract not in violation of the statutory provisions and not inimical to the welfare of the state is enforceable. Either party to a legal contract may make, as a part thereof, the most absurd and unreasonable conditions, considered from a standpoint of equity, which if agreed to become binding. Conditions imposed, however, must be explicit and not subject to more than one reasonable interpretation and must be judged by whatever measure may be elevated to a standard. Further, the party imposing the conditions must be sufficiently informed to know and to realize their general application.

This is the flaw in the position of the buyer: The terms made a part of the order are not definite and merely provide for a discount of 2 percent to be allowed within ten days with no basis whatever for ascertaining when the ten-day period is to begin. In the absence of such information and in accordance with the custom, as I understand it, and as adopted by various associations and set forth on the stationery of lumber manufacturers, it must be construed to begin from the date a shipment is made. Had A stipulated in the order that the terms were to be 2 percent ten days from date of delivery instead of simply 2 percent ten days there could have been no possible ground for dispute. In so far as was provided it could have been held that the 2 percent discount was to be taken

within ten days of the time the lumber was sold by the buyer and paid for, which is unreasonable on its face.

Manufacturers and wholesalers very largely are to blame for the present misunderstanding or misinterpretation of terms of credit and the frequent disputes in regard thereto. The fact that buyers have been permitted to discount their bills, providing settlement were made within ten days of the arrival of the car, has fortified their natural inclination in this direction to such an extent that by some it has been regarded as a right. I cannot, however, concur in this view and do not think that past ability to have wishes in this particular respected can be regarded as establishing a rule for the adjudication of future controversies.

One other point on which I desire to say a word is relative to the contention on the part of the shipper who holds that a shipment may be said to have arrived when the car or cars shall have reached the city terminals. Delivery according to eminent demurrage authorities is not made until the car is placed for unloading. I do not think it logical to hold that consignment has reached destination until it has been delivered to a point where the consignee can secure his goods.

In conformity with the foregoing it is held that purchaser was not entitled to a discount.

PART X.—ASSOCIATIONS.

National Association of Sash & Door Salesmen.

When was the National Association of Sash & Door Salesmen organized, and what were its chief objects?

The National association, which was made up of delegates from other associations of lumber sash and door salesmen, was organized in Chicago, December 19, 1902. Its chief object was the harmonizing of the interests of salaried and commissioned salesmen and the interests of all salesmen with the manufacturers and wholesalers. Other objects were the promotion of honest and ethical business methods and the assistance of all worthy members who might be in distress.

How Association Inspectors Are Paid.

How do the lumber manufacturers' associations pay their inspectors?

The custom today is to pay the inspectors a straight salary and their expenses when on the road. Representatives of inspection bureaus of various associations, stationed at some market, usually are compensated on a salary basis, although this is not always the case. In the early days of the National Hardwood Lumber Association, for instance, the inspectors were paid by fees. Some of them did not have more than a few months' work each year and it was necessary to supplement their fees by other employment. The fee method was the simplest way of determining the amount they had earned. The argument has frequent-

ly been advanced that the fee method of paying inspectors results in their soliciting business and thus increases the revenue of the association, as part of the fees goes into the association treasury. This is rather a dangerous method of swelling receipts, as there is a possibility of the inspector favoring the people who give him the business and pay the fees. A more businesslike way is to pay a salary, which method is being followed by the larger lumber organizations.

Value of the Association to the Individual.

Of what value is the association to the individual member?

So many benefits are conferred upon its members by any well conducted lumber association that it is difficult adequately to answer the above question in a limited space. However, some of the benefits conferred may be briefly alluded to, although many of them are necessarily general and each in itself refers to a number of other heads. The association helps the member to develop his business and to develop the state in which that business is located. It is a powerful factor in the adjustment of disputes with the railroad companies in regard to rates, demurrage, car shortage, car equipment and other matters in which the individual dealer would be absolutely powerless. It cheapens fire insurance; it keeps the dealer posted on current events of interest and value; at its meetings it affords him the advantage of listening to the valuable experiences of the brightest men in the trade in his state and gives him at first hand results which have cost them a great deal of money to achieve. It helps him in securing more pleasant and harmonious relations with his trade, with his brother dealers and with the manufacturers from whom he buys.

The greatest of all these benefits undoubtedly is the better feeling established among the retail trade, which leads to the elimination of the practice of unreasonable and unbusinesslike cutting of prices, encroaching upon outside territory and in general of making life miserable.

Lumber Secretaries' Bureau of Information.

What associations originally were identified with the Lumber Secretaries' Bureau of Information and by whom were they represented?

H. H. Hemenway, secretary Colorado & Wyoming Lumber Dealers' Association.

George W. Hotchkiss, secretary Illinois Lumber Dealers' Association.

W. H. Hunter, vice president Illinois Lumber Dealers' Association.

W. T. Boston, president Illinois Lumber Dealers' Association.

H. C. Scarce, secretary Retail Lumber Dealers' Association of Indiana.

A. L. Holmes, secretary Michigan Retail Lumber Dealers' Association.

Bird Critchfield, secretary Nebraska Lumber Dealers' Association.

O. O. Snyder, president Nebraska Lumber Dealers' Association.

W. G. Hollis, secretary Northwestern Lumbermen's Association.

George C. Ingram, president Northwestern Lumbermen's Association.

H. A. Gorsuch, secretary Southwestern Lumbermen's Association.

J. R. Moorhead, director Southwestern Lumbermen's Association.

H. L. Adams, secretary Union Association of Lumber Dealers.

A. L. Porter, secretary Western Retail Lumbermen's Association.

Paul Lachmund, secretary Wisconsin Retail Lumber Dealers' Association.

George H. Keehn, secretary Cook County Lumber Dealers' Association.

R. Kind, secretary National Builders' & Supply Association.

Lumber Associations of the United States.

What are the associations in the United States devoted to the lumber and allied industries, when were they organized and what are the names and addresses of their secretaries?

The associations are given below in their alphabetical order. The secretaries named were those in office in 1906. It is the general rule that the secretary of the lumber association shall be continued in office for a number of years and, therefore, the gentlemen mentioned in all probability will officiate in their present capacities for several years. In the event that any of them should be succeeded during the elections to take place in the fall of 1906 and the spring of 1907, a communication addressed to them doubtless would be forwarded to the then incumbents.

Adirondack Lumber Manufacturers' & Shippers' Association, organized April 14, 1906; secretary, L. L. Ashley, Utica, N. Y.

Alabama Lumber Manufacturers' Association, organized May 9, 1905; secretary, J. H. Eddy, Birmingham, Ala.

American Supply & Machinery Manufacturers' Association, organized April 27, 1905; secretary, F. D. Mitchell, 309 Broadway, New York.

Arkansas Association of Lumber Dealers, organized June 3, 1904; secretary, C. M. Dickinson, Paragould, Ark.

Arkansas Short Leaf Yellow Pine Association, organized March 29, 1905; secretary, Oliver O. Bright, Warren, Ark.

Boise Valley Retail Lumbermen's Association, organized November 21, 1905; secretary, W. B. Knowlton, Nampa, Ida.

Central Association of Traveling Lumber, Sash & Door Salesmen, organized February 23, 1892; secretary, H. L. Hart, La Porte, Ind.

Canadian Forestry Association, organized March 8, 1900; secretary, R. H. Campbell, Department of the Interior, Ottawa, Ont.

Central Iowa Retail Lumbermen's Association, organized February 26, 1895; secretary, C. E. Greef, Eldora, Iowa.

Central Ohio Retail Lumber Dealers' Association, organized May 10, 1903; secretary, O. Wollenweber, Marion, Ohio.

Colorado & Wyoming Lumber Dealers' Association, organized April 16, 1903; secretary, H. H. Hemenway, Colorado Springs, Colo.

Columbia River Shingle Association, organized December 23, 1905; secretary, E. H. Habighorst, 208 Falling building, Portland, Ore.

Corn Belt Retail Lumber Dealers' Association, organized April 5, 1905; secretary, A. A. Brooks, Stanford, Ill.

Decatur District Retail Lumber Dealers' Association, organized November 20, 1903; secretary, F. L. McGavic (McGavic Lumber Company), Decatur, Ill.

Eastern States Retail Lumber Dealers' Association, secretary, L. A. Mansfield, 505 Grand avenue, New Haven, Conn.

Eastern Door, Sash & Blind Manufacturers' Association, organized in March, 1893; secretary, G. W. Dwelle, Syracuse, N. Y.

Grays Harbor Lumber Manufacturers' Association, organized March 8, 1906; secretary, W. R. McFarlane, Hoquiam, Wash.

Georgia Inter-State Saw Mill Association, organized in 1899; secretary, Elwood C. Warren, Tifton, Ga.

Fox River Lumbermen's Club, organized July 1, 1902; secretary, Frank D. Lawrence, Geneva, Ill.

Hardwood Manufacturers' Association of the United States, organized June 3, 1902; secretary, Lewis Doster, First National Bank building, Chicago.

Hudson County Retail Lumber Dealers' Association, or-

ganized May 4, 1897; secretary, Charles E. Hendrickson, jr., 15 Exchange place, Jersey City, N. J.

Indiana Hardwood Lumbermen's Association, organized March 16, 1899; secretary, J. M. Pritchard, Indianapolis, Ind.

Illinois Lumber Dealers' Association, organized June 12, 1890; secretary, George W. Hotchkiss, 315 Dearborn street, Chicago, Ill.

Illinois Masons' Supply Association, organized January 15, 1906; secretary, G. J. Parke, Decatur, Ill.

Illinois River Valley Retail Lumbermen's Association, organized March 14, 1899; secretary, C. A. Sanders, Ottawa, Canada.

Idaho-Oregon Lumber Dealers' Association, organized November 26, 1905; secretary, L. Adams, Ontario, Ore.

The Lumber Dealers' Association of Connecticut, organized in May, 1892; secretary, Louis A. Mansfield, New Haven, Conn.

Lumber Carriers' Association, organized in January, 1901; secretary, H. E. Runnels, Port Huron, Mich.

Lumber Dealers' Association of Rhode Island, reorganized April 11, 1901; secretary, G. Waldo Parrott, Providence, R. I.

Lumber Dealers' Association of St. Louis, organized February 1, 1906; secretary, John B. Kessler, 924 Missouri Trust building, St. Louis, Mo.

Lumbermen's Association of Chicago, organized in 1869; secretary, E. E. Hooper, 1312 Rector building, Chicago.

The Lumbermen's Association of Ontario, organized March 30, 1887; secretary, W. B. Tindall, 74 Home Life building, Toronto, Ont.

Lumbermen's Association of Texas, organized May 15, 1886; secretary, S. T. Swinford, Houston, Tex.

Lumbermen's Exchange of Philadelphia, organized in 1886; secretary, George H. Louk, Philadelphia, Pa.

Lumbermen's Club of Memphis, organized December 19, 1898; secretary, George C. Ehemann, care Bennett & Witte, Memphis, Tenn.

Massachusetts Retail Lumber Dealers' Association, organized December 10, 1901; secretary, George A. Denison, Springfield, Mass.

Massachusetts Wholesale Lumber Association, organized

about 1872; secretary, W. C. B. Robbins, 88 Broad street, Boston, Mass.

Michigan Association of Traveling Lumber & Sash & Door Salesmen, organized February 8, 1905; secretary, Irwin Earl, 510 The Lenox, Detroit, Mich.

Michigan Hardwood Manufacturers' Association, organized July 14, 1906; secretary, Bruce Odell, Cadillac, Mich.

Michigan Retail Lumber Dealers' Association, organized December, 1887; secretary, Arthur L. Holmes, Detroit, Mich.

Mississippi Lumbermen's Association, organized in January, 1905; secretary, W. C. Rodgers, Hattiesburg, Miss.

The National Lumber Manufacturers' Association, organized December 9 and 10, 1902; secretary, George K. Smith, 704 Equitable building, St Louis, Mo.

National Association of Box Manufacturers; secretary, E. H. Defebaugh, Louisville, Ky.

National Hardwood Lumber Association, organized May, 1896; secretary, F. F. Fish, Indianapolis, Ind.

National Lumber Exporters' Association, organized January 24, 1900; secretary, Edward M. Terry, 79 Madison street, Memphis, Tenn.

National Veneer & Panel Association, organized in December, 1905; secretary, E. H. Defebaugh, Louisville, Ky.

National Wholesale Lumber Dealers' Association, organized in 1893; secretary, E. F. Perry, 66 Broadway, New York City.

National Slack Cooperage Manufacturers' Association, organized April 20, 1899; secretary, J. S. Palmer, Sebawaing, Mich.

National Association of Lumber & Sash & Door Salesmen, organized March 13, 1903; secretary, W. R. Mackenzie, Madison, Wis.

Nebraska Lumber Dealers' Association, organized in 1890; secretary, BIRD Critchfield, Lincoln, Neb.

National Builders' Supply Association, organized in 1898; secretary, Richard Kind, Toledo, Ohio.

New Hampshire Lumbermen's Association, organized in March, 1904; secretary, Frank E. Parker, Nashua, N. H.

New Orleans Lumber Exporters' Association, organized January 3, 1906; secretary, Ludwig Hayman, 1020 Hibernia building, New Orleans, La.

New Jersey Lumbermen's Protective Association, organ-

ized March 11, 1885; secretary, James M. Reilly, 764 Broad street, Newark, N. J.

New York Lumber Trade Association, organized November 8, 1886; secretary, J. D. Crary, 18 Broadway, New York City.

The North Carolina Pine Association, organized in March, 1897; secretary, John R. Walker, Norfolk, Va.

Niagara County Retail Lumber Dealers' Association, organized June 12, 1903; secretary, Henry P. Murphy, Lockport, N. Y.

North Central Minnesota Lumbermen's Association, organized March 14, 1902; secretary, G. C. Ingram, Sauk Center, Minn.

Northeastern Retail Lumbermen's Association, organized in January, 1900; secretary, W. T. Purdie, Willow Lake, S. D.

North Side Lumber Dealers' Association, organized in 1898; secretary, James Fryer, 618 Chamber of Commerce, Chicago, Ill.

Northern Colorado Lumbermen's Association, organized October 8, 1902; secretary, Reed Hayward, Loveland, Colo.

Northern Indiana & Southern Michigan Lumber Dealers' Association, organized March 24, 1900; secretary, James W. Taylor, South Bend, Ind.

Northern Pine Manufacturers' Association, organized January 23, 1906; secretary, J. E. Rhodes, Lumber Exchange, Minneapolis, Minn.

Northwestern Cedarmen's Association, organized in 1887; secretary, Milton O. Nelson, Lumber Exchange, Minneapolis, Minn.

Northwest Cement Products Association, organized January 23, 1905; secretary, George Hughes, Minneapolis, Minn.

Northwestern Hardwood Lumbermen's Association, organized January 30, 1889; secretary, J. F. Hayden, Lumber Exchange, Minneapolis, Minn.

Northwestern Hemlock Manufacturers' Association, organized in 1897; secretary, J. E. Rhodes, Lumber Exchange, Minneapolis, Minn.

Northwestern Illinois Retail Lumbermen's Club, organized July 15, 1896; secretary, B. P. Hill, Freeport, Ill.

Northwestern Iowa Retail Lumbermen's Association, organized May 23, 1895; secretary, James F. Weart, Cherokee, Iowa.

Northwestern Lumber & Sash & Door Traveling Salesmen's Association, organized August 7, 1897; secretary, Robert Blackburn, Milwaukee, Wis.

Northwestern Lumbermen's Association, organized January 31, 1889; secretary, W. G. Hollis, Lumber Exchange, Minneapolis, Minn.

Oregon Lumber Manufacturers' Association, organized May 6, 1905; secretary, Edmund P. Sheldon, Portland, Ore.

Pine Manufacturers' Association, organized October 11, 1898; secretary, W. H. Jordan, jr., 6 California street, San Francisco, Cal.

Pacific Coast Lumber Manufacturers' Association, organized January 10, 1901; secretary, Victor H. Beckman, Seattle, Wash.

Pennsylvania Lumbermen's Association, organized March 22, 1892; secretary, B. F. Laudig, Scranton, Pa.

Pittsburg Wholesale Lumber Dealers' Association, organized in March, 1901; secretary, J. H. Henderson, House building, Pittsburg, Pa.

Philadelphia Wholesale Lumber Dealers' Association, organized April 3, 1894; secretary, F. S. Underhill, Real Estate Trust building, Philadelphia, Pa.

Retail Lumber Dealers' Association of Alabama & Tennessee, organized August 1, 1904; secretary, W. E. Wallis, Birmingham, Ala.

Retail Lumber Dealers' Association of Indiana, organized June, 1884; secretary, H. C. Searce, Mooresville, Ind.

Retail Lumber Dealers' Association of Mississippi & Louisiana, organized August 27, 1897; secretary, W. G. Harlow, Yazoo City, Miss.

Retail Lumber Dealers' Association of West Tennessee & Kentucky, organized April 26, 1905; secretary, R. P. Brandsford, Union City, Tenn.

Retail Lumber Dealers' Association of the State of New York, organized February 29, 1894; secretary, George Wilson-Jones, Utica, N. Y.

Retail Lumbermen's Association of Philadelphia, organized December 8, 1903; secretary, Charles P. Maule, Philadelphia, Pa.

Saginaw Valley Lumber Dealers' Association, organized January 19, 1891; secretary, L. H. Briggs, Saginaw, Mich.

Southeast Missouri Retail Lumber Dealers' Association,

organized April 18, 1906; secretary, Henry L. Caldwell, Jackson, Mo.

Southeastern Iowa Retail Lumbermen's Association, organized June 12, 1896; secretary, C. M. Porter, Oskaloosa, Iowa.

Southeastern South Dakota Retail Lumber Dealers' Association, organized in 1896 or 1897; secretary, F. S. Vaughan, Yankton, S. D.

Southern Cypress Manufacturers' Association, organized May 11, 1905; secretary, George E. Watson, New Orleans, La.

Southern Illinois Lumber Dealers' Association, organized March 24, 1898; secretary, Charles W. Hall, Sandoval, Ill.

Southern Lumber Manufacturers' Association, organized in December, 1890; secretary, George K. Smith, St. Louis, Mo.

Southern Supply & Machinery Dealers' Association, organized April 15, 1902.

Southwestern Association of Lumber & Sash & Door Salesmen, organized January 24, 1904; secretary, John F. Bruce, 417 Knights of Pythias building, Kansas City, Mo.

Southwestern Lumbermen's Association, organized February 12, 1889; secretary, Harry A. Gorsuch, Kansas City, Mo.

Southwestern Washington Lumber Manufacturers' Association, organized January 10, 1900; secretary, C. A. Doty, Doty, Wash.

Twin States Association, organized February 4, 1904; secretary, G. W. O'Halloran, Pittsburg, Kan.

Twin Territories Retail Lumber Dealers' Association, organized May 30, 1903; secretary, J. E. Marrs, Oklahoma City, Okla.

Utah State Retail Lumber Dealers' Association, organized in January, 1906; secretary, Theodore Nystrom, Salt Lake City, Utah.

Union Association of Lumber Dealers, organized in 1882; secretary, H. S. Adams, Chillicothe, Ohio.

Union Association of Traveling Lumber & Sash & Door Salesmen, organized January 22, 1901; secretary, Charles C. Thornton, Granville, Ohio.

White Pine Association, organized in December, 1903; secretary, George S. Dailey, North Tonawanda, N. Y.

Western Pine Shippers' Association, organized February 11, 1903; secretary, R. A. Kellogg, Spokane, Wash.

QUESTIONS AND ANSWERS. 401

The Wholesale Lumber Dealers' Association of Cleveland, Ohio, organized March 12, 1897; secretary, J. V. O'Brien, Cleveland, Ohio.

Western Retail Lumbermen's Association, organized in May, 1903; secretary, A. L. Porter, Spokane, Wash.

Wisconsin Hardwood Lumbermen's Association, organized September 17, 1895; secretary, A. E. Beebee, McMillan, Wis.

Wisconsin Retail Lumber Dealers' Association, organized March 25, 1890; secretary, Paul Lachmund, Sauk City, Wis.

PART XI.—TIMBER.

TREE GROWTH.

Tree Growth, Annual Rings.

Do all concentric circles in tree growth indicate annual periods of growth?

In northern sections where the climate is not cold these circles are known as annual rings and are taken to indicate the life of the tree in years, but experiments in tropical countries tend to show that in hot, moist climates these rings grow more rapidly and probably are formed more frequently.

Rate of Growth.

What might be considered an average increase in tree growth by forestation?

This is a very general question and one which can be answered only by approximate figures. Tree growth varies according to species, soil, climate and various other local conditions. The broad statement might be made, however, that taking the country through from one end to the other the average annual accretion would be about 2 percent.

How Trees Grow.

How does a tree grow?

Tree growth shows in the form of rings, which in northern climates are measures of annual increase. These rings extend to the top of the tree, accounting

for its increase in height. In other words, one year's growth is not included in that of the succeeding year. A spike driven into a tree trunk four feet above the ground would be found the same distance up the trunk ten years after it has been driven into place.

Wisconsin's Largest Pine Tree.

What was the largest pine tree ever cut in Wisconsin?

What is said to have been the largest pine log ever cut in that state was attempted to be floated down the Chippewa river from one of the camps of John Grinsell, on the western bank of the Flambeau river. It measured sixteen feet in length and contained 2,320 feet of lumber, log scale. For a long time it seemed impossible to float this log down the river and it was nineteen years from the time it was cut until it finally was gotten out. The log was said to have been about nine feet through the butt.

Famous American Trees.

What are some of the trees famous in American history?

The pecan tree below New Orleans under which a portion of the remains of General Pakenham are buried.

The mammoth magnolia at Charleston, S. C., under which General Lincoln held his council of war before surrendering the city.

The black walnut tree at Havestraw, on the Hudson, where General Wayne mustered his forces at midnight, before his successful attack on Stony Point.

The immense apple tree at Fort Wayne, Ind., under which Little Turtle, the great Miami chief, gathered his warriors.

The famous oak at Flushing, Long Island, under which George Fox perished.

The Charter Oak at Hartford, which preserved the written guaranty of the liberties of Connecticut.

Quite a number of ancient trees beside the Washington elm have a place in our national history, and are inseparable from it, because they are a part of it, such as the great elm at Philadelphia under which William Penn made his famous treaty with nineteen tribes of Indians.

Could the grand old Washington elm speak, what a story it could tell. It saw the passing of the red man and the coming of the white. It was here to welcome John Harvard and has seen the marvelous strides of the little school he planted. It has seen the quakers and witches hanged and the Baptists, banished, it has seen creeds modified so their authors would not know them and the fires of hell drawn. Human slavery has come and gone. It has seen more improvement in the human race than was made from the birth of Adam to the death of Lincoln. It has welcomed every governor from Winthrop to Crane.

Characteristics of Trees on the Mississippi Delta.

What are the characteristics of the trees growing on the Mississippi delta lands?

Originally, this delta, which was formed by the alluvial deposits of centuries, was covered by an unbroken growth of forest and a large portion of it still is. The soil is exceedingly rich and the tree growth is heavy. Cypress runs from 50 to 75 feet without a limb. Oaks nine feet in diameter at the butt are not uncommon and red gum are found up to seven feet in diameter. There is practically no undergrowth in the delta forest, the leaves and small limbs which fall being eaten up by the calcareous soil. The most

valuable trees in these delta forests are cypress, overcup and white or cow oak.

Witness Trees.

What is a witness tree?

In early days surveys were made on a sectional basis, the section corners being marked by wooden stakes. These stakes were small, however, and if there happened to be a tree near the stake the marks were repeated on the trunk of the tree. Thus section 8 in township 56 north range 7 west would be marked R7W, T56N, S8. The trees upon which the marks were made were called "witness trees."

Spiral Growth in Trees.

What is the cause of spiral growth in trees?

Freak growths of this character are not limited to any one species but are found in hardwoods, pine and many others of the trees of this and other countries. The percentage of such trees, however, has been so small that little attention has been given to the unusual specimens.

Every lumber manufacturer occasionally comes across a tree which has grown in a spiral-like manner—the grain seemingly being wrapped around the core.

Certain of the mahogany importers of London are inclined to attribute this character of growth to the influence of the sun. It is claimed that under certain conditions trees show a greater accretion of fiber on the sunny side, and the oscillating movement of the earth causes the sun to shine on one side and gradually draw around to the opposite side, and those who claim that the spiral growth is due to the sun's influence aver that the attractions of the sun's rays are sufficient to cause the tree to turn.

As it is expressed by one of the correspondents on this question: "The attraction of the sun's rays is sufficiently powerful to cause the laterals to turn the apex. Thus we see a given point, say facing south, in time encircle the tree and again appear on the south but much higher up the trunk. The difference between such trees—those growing north or south of the equator—is that one has the inclination to grow spirally from right to left, the other from left to right, looking at them individually with your back to the equator."

An authority says:

While the natural direction of the fibers in growing trees is vertical, yet the fiber of most trees tends, at least to a certain extent, to wind spirally around the axis of the stem. This abnormal spiral growth or torsion of the fibers is not yet accounted for satisfactorily, but it may partially be explained on the following well grounded theories:

(1) It is a fact recognized by all foresters that trees always follow a definite mechanical law in the building up of their structures and tend to strengthen themselves at all points where the strains caused by winds, storms etc. are the greatest. If greater strength and greater powers of resistance can be secured by spiral growth then the latter occurs as a result of this mechanical law of growth.

(2) If the cambium cells (growing cells) grow so rapidly in length that there is not sufficient room for them to continue in their normal vertical direction they are crowded to one side and, following the line of least resistance, take a spiral or slanting direction.

(3) If the cambium cells, at the beginning of the annual growth in the spring, are in a spiral position, the resulting fibers will take a spiral direction of growth.

The theory that the torsion is directly caused by the influence of the sun cannot possibly be tenable, as is obvious from the following facts: Lombardy poplar, no matter where grown, always shows a clockwise torsion of the fibers, while horse chestnut invariably shows the reverse or counter-clockwise torsion. At Biltmore more than 100 chestnut trees were carefully examined and it was found

that some of them showed clockwise, while others showed counter-clockwise torsion. It was also noticed that the torsion was greater near the butts of the older trees. This fact supports our second theory stated above, since the cells near the butts grow very rapidly on account of their proximity to the enormous amount of food supplied by the main lateral roots.

In the case of many of our common species the same tree may frequently show opposite directions of growth in alternating annual rings, and instances are sometimes found where the opposite direction of growth occurs in the same layer of wood, thus forming what is known as cross grained wood. In many tropical woods, especially *lignum vitae*, the fibers naturally grow in all directions and interlace so thoroughly that the wood can be split only with great difficulty.

There may be a certain connection between the influence of the sun and the torsion of the fibers, since trees grown in the open generally show more torsion than those grown in dense stands, but this connection may be definitely explained by the fact that increased light stimulates the cambium cells to greater activity, thus crowding them all the more from their normal vertical direction of growth. In the Bavarian hills and in Switzerland forests are found, however, where even in dense stands from 60 to 80 percent of the trees shows spiral or twisted growth.

TIMBER PRESERVATION.

To Prevent Decay in Timber.

What causes decay in timber and how may it be prevented?

Heat, air and water, or, to put them in the order of their importance, water, air and heat produce fungi. All woods contain certain organic substances upon which these fungi live. If the wood cells are filled with creosote or some other preservative which will prevent the growth of fungi, the wood will not "rot."

Fireproofed Lumber.

Is it possible to fireproof lumber, and if so of what does the operation consist?

The material is piled on trucks and the latter placed in a large iron cylinder which is air and water proof. The cylinder is then closed and pumped full of a chemical solution. The lumber is allowed to remain in the cylinder from two days to a week, according to its hardness and the corresponding difficulty in filling the wood cells. Fireproofed wood never has come into general use and it is doubtful whether the treatment justifies the claims made for it.

Treatment of Fence Posts to Prevent Decay.

Could fence posts be treated with a preservative in an open vessel—the end that goes in the ground?

Extensive experiments have been made by the Forest Service with a view to establishing some system for the treatment of telegraph and telephone poles which shall not involve heavy expenditure. From the reports of those who have had this work in charge the following summary of the methods used is given, the treatment recommended applying particularly to telegraph and telephone poles, though undoubtedly it should be applicable for the treatment of fence posts:

The experiments already made by the bureau show conclusively that poles can be subjected to a preservative treatment which insures materially lengthened service. This treatment consists in impregnating the wood with antiseptics which prevent the growth of the fungi that cause decay. The treatment of telegraph and telephone poles, when attempted at all in this country, generally has been applied to the whole pole, requiring the use of air-tight cylinders 100 feet long or more. In these the poles are subjected to live steam for some time, after which a vacuum is created. Creosote is then run in and pressure applied to force it into the wood.

Manifestly this is a laborious process. Yet for telegraph and telephone poles only about one foot of the entire length needs to be made immune from fungus. If this foot at the fatal ground line can be preserved from decay the rest of the pole will take care of itself. The experiments will now be made in treating the butts of the poles for a distance of about eight feet, thus carrying the antiseptics just beyond the zone of decay attack. The creosote method will be used and dead oil of coal tar forced through the butt of the pole.

The telegraph companies have made little use of preservative treatment. They employ millions of poles on their various lines and it would be a tremendous economy to add even a few years of service to the life of each pole. But there will be another large saving both to them and to the forests through preservative treatment. To provide a good margin against decay poles are now much larger than demanded by the strain upon them. It is expected that decay will quickly eat away a furrow around the pole at the ground line and the diameter of the pole at that point is gaged to allow for this weakening process. When it is known that decay, in a certain number of years, cuts the diameter from perhaps twelve to eight inches and that below eight inches the weakened pole falls, the course to be pursued is obvious.

Antiseptics prevent, for the time of their effectiveness, the starting of decay and thus permit at the outset the selection of an 8-inch diameter rather than a 12-inch. The four inches saved represent a tremendous difference in the size and age of trees used for poles. Both the companies and the owners of forests will be great gainers by this economy, with its shortening of the length of time necessary to grow a pole.

Another feature of the coöperative work will be treatment of cross arms. The companies have been treating them, but report too much absorption in some cases and not enough in others. The bureau will more carefully grade the different kinds of wood and treat each class separately. In this way it is expected to secure a more equal absorption and more satisfactory results. These are the main points covered by the contracts, though in addition the bureau will furnish information on the supply of pole timber and such general advice as may be suggested by the coöperative work.

Creosote Production.

How is creosote produced as a commercial article, and what is the price?

Creosote is dead oil of coal tar and is secured by a process of distillation. It is difficult to give a price on any article of commerce. Much depends upon the ability of the purchaser to make an advantageous contract and the condition of the market at the time it is desired to secure the article. A considerable portion of the creosote used by preserving works in this country is secured from abroad, the principal countries from which it is received being England, Germany, Scotland and Canada.

Creosote is of greater specific gravity than water, the weight varying from eight to nine pounds to the gallon.

How to Protect Fence Posts.

In what manner can fence posts be treated so as to overcome the tendency to decay at the weak point—where they enter the ground?

Many tests and experiments have been made with a view of perfecting some method of guarding against attack of fungi and decay but so far entire success has not awaited upon the study of the experimentors. In 1882 this panacea was recommended: Take boiled linseed oil and stir in pulverized coal to the consistency of paint. Put a coat of this over the timber and there is not a man living who ever will see it rot.

Preservatives for Poles.

How may the life of telegraph and telephone poles be increased?

The point at which cedar posts and poles decay first is the grade line, that is the point where the pole or

post enters the ground. Above the wood will remain good for a number of years and below the surface almost indefinitely, but at the point where air and earth meet, fungi starts following decay and reaching up and down destroys the strength of the wood with comparative rapidity. Experiments made by the Forest Service have shown that it is possible to inject a preservative around the poles at this point and greatly increase their service. This preservative is an antiseptic which prevents the growth of fungi.

Fireproof Roofing.

Is there such a thing as fireproof roofing?

Several roofing materials are in use, for which their manufacturers claim to be fire resistant and undoubtedly they are so far as ignition from sparks is concerned, but at the present time there probably is no roofing material save tile which would be proof against intense, concentrated and lasting heat.

Sugar Cured Lumber.

I saw an article some time ago relating to the treatment of lumber and posts with sugar to prevent rot. I do not remember where I saw the article and would ask as a favor of you if you know of anyone with whom I could correspond; if you could give me any information on the subject I would consider it a great favor.

This subject is worthy of special consideration. Probably the best answer that can be given is to quote at length from a summary of the process compiled especially for the *AMERICAN LUMBERMAN* by Dr. Herman von Schrenk, of the Bureau of Forestry:

The Powell process of wood preserving is one which uses ordinary sugar, with which the timber is impregnated, for the purpose of preventing its decay. The

timber is usually treated in small dimensions. The process of treatment is briefly as follows: After the timber has been weighed and labeled it is placed into a steel cylinder or boiler which is filled to three-fourths of its capacity with water to which four and one-half pounds of ordinary sugar for every gallon of water is added. Sufficient solution should be in the cylinder to cover the timber three to four inches when it is pressed down. When treated in an open boiler water should be added from time to time to keep the solution of uniform strength throughout the process. From time to time sugar solution must be added to counterbalance the absorption. Any exposure of the timber above the surface of the solution during the absorption stage is likely to damage it permanently. After a thorough penetration has been obtained the wood should be taken out of the boiler or cylinder and put into a dry kiln, where it is dried at a temperature starting with not more than 80 to 100 degrees Fahrenheit, gradually raising to 250 degrees. Great care and judgment are required in the drying process.

Powellized timber is said to withstand much higher temperature than other timber, but great care must be used to raise the temperature gradually and not too rapidly. No fixed time can be given for the period during which timber should be dried, as that will depend upon the amount of solution absorbed. Poplar, for instance, will take three to four times as long to dry as pine.

Where the wood is green or saturated with water it will be necessary to extract sap or moisture before beginning the first part of the process.

MATERIALS USED FOR THE TREATMENT.

The following is quoted from a recent bulletin: "The calculation of four and one-half pounds of sugar to the gallon of water is made for beetroot sugar polarizing

88 percent, such as is commonly used for refining. This will make a solution with a specific gravity of 1.150 at 60 degrees Fahrenheit. Cane sugar will serve equally well, or possibly better for some purposes, but being more hygroscopic than beet sugar it has a tendency to make the timber feel moist in damp weather unless the outside of the wood should be well cleaned. Where timber processed with cane sugar is afterward turned or manufactured no such dampness is perceived.

"Sugar, not syrup, should be used in processing fine timber or wood intended for furniture and ornamental uses, joinery, panels, carriages, shuttles, handles, cues, golf shafts, cogs etc., but syrup, either cane or beetroot, may be used with great advantage especially as regards price, for timber designed for any of the commoner uses, such as for structural work, paving, flooring, railway work, jetties, piers, decks, wharves, scaffolding, carts, wagons etc.

"Beetroot syrup contains about 50 percent sugar, 10 of potassium salts, 10 of sodium salts, 5 of inorganic and organic substances and 25 of water. The salts in the syrup, in these proportions, are of but slightly less value than the sugar itself and, therefore, it may be taken that syrup contains 70 percent of valuable preservative matter. Consequently if one gallon of syrup weighing, say, twelve pounds be added to each two gallons of water it yields a solution about equal, in specific gravity and quality, to the sugar solution, so that six pounds of syrup to the gallon of water will produce the same solution as four and one-half pounds of sugar.

"Syrup suitable for Powellizing timber may be purchased in any of the chief ports of the world at from 30 shillings to £3 (\$7.50 to \$14.40) a ton. In countries where sugar is grown this byproduct is, in many

cases, difficult to dispose of and in some cases actually costs money to destroy.

"In no case is free sugar found in Powellized timber —i. e., the sugar is so absorbed by the wood fiber that no sugar crystals can be seen under the strongest microscope."

The Powell process for treating wood has attracted widespread attention in England during the last year. The claims made for it are that green, sappy wood can in a very short time be seasoned so that it will not warp or check. A farther claim made for the process is that it increases the density, hardness and strength of the wood very materially. Professor Boulger says that "Beech which before being Powellized has proved on analysis to consist of 92.3 percent wood fiber and 7.7 percent moisture and extractable matter, after processing consists of 81 percent wood fiber, 16.6 percent sugar and 2.4 percent moisture. With such increase of density other valuable characters, such as hardness, are usually proportionately increased, while experimental tests have shown that there is no loss of toughness, tensile strength or flexibility, but some decrease in inflammability. Such results as the increase of the density of poplar by 70 percent and the increase of the strength of yellow pine by 107 percent are most remarkable."

TIMBER FACTS.

First Conviction of Trespassing on Public Domain.

Who was the first man in this country convicted of taking timber from the public domain?

Not definitely known, but it is related that the original American Whittier, a forbear of the poet, was convicted in 1743 of taking timber from crown lands in

Massachusetts and fined five pounds. Eight generations of this family, it is said, were engaged in the lumber business. All of them, however, did not secure their logs in the same manner as is alleged the founder used.

Insurance of Standing Timber.

Are there any companies insuring standing timber?

There are not. So far every lumberman who has acquired a tract of timber has taken his chance on its being burned. Possibly some insurance company could be induced to write policies covering timber if it could be assured that a considerable percentage of timber holders would patronize it, but most timbermen figure in the risk of a fire loss when purchasing their stumpage and it is improbable that many of them would insure their holdings if they were given opportunity. Then again it would be exceedingly difficult to obtain statistics upon which to base rates. Sometimes several years pass with practically no timber loss in a state and then there will be a season of exceptional dryness and high winds and immense losses will follow. Altogether it does not seem as though fire insurance for timber was practicable. It is possible for the lumberman to insure his own timber in a measure by protecting it from fire and it is also feasible for a number of those owning adjoining timber tracts to combine for the protection of the whole.

Dead and Down Timber Law.

What was the dead and down timber law and how did it affect standing growth on the Indian reservations?

The primary idea in the enactment of the dead and down timber law was to afford a source of revenue to the Indians, to furnish them with an occupation and

at the same time to protect the forests upon the Indian reservations. Under its provisions the Indians were allowed to sell burned over timber or timber which had fallen to the ground, the only stipulation being that they should do the work themselves. The law did not work out as expected, however, for the Indians did not wait for forest fires to prepare tracts for them to sell but when the supply ran short set fire to the underbrush and burned over large areas. The Indians did not do the work of logging either and in a great many cases lumbermen purchasing timber under this enactment found themselves involved in extensive and expensive litigation because of the failure of the Indians to live up to the provisions of the act under which the sales were made.

Value of Fire Killed Timber.

What is the value of fire killed timber, and how soon after a fire does it lose its value?

Investigations by the forest service have shown that when a fire runs through a tract of green timber its value does not deteriorate materially for two or three years, after which the timber is practically worthless. Fire killed timber is said to have been used in Colorado in mining and railroad work, and much of this timber had been dead from three to five years but gives excellent service to the users. This is explained by the fact that burning of the surface of the trees is said in the case of western pine to preserve the wood. Burnt timber has been sold to be used for box boards, telegraph poles, mining timber and for miscellaneous purposes. A recent writer says:

Red fir is preferred for railroad ties, then yellow pine, limber pine and range pine. White pine has been objected to because of its lack of durability, but it is now taken in

many places. At Rosemont, Col., burned timber of all kinds is made into ties, some of the material having been burned fifty years ago. It is asserted that dry ties last as long as green ties and in many cases longer. On the Cripple Creek "short line" they were more satisfactory than green pine ties from Texas. Dry ties hold a spike well, and a tie plate does not cut into the wood so seriously as it does in the case of a green tie. Engelmann spruce is as good as other species so far as mechanical wear is concerned, but it decays much quicker and so should be given a preservative treatment.

Burned timber was first used for boxes by the Denver Crate & Box Company in February, 1903, the species used being Engelmann spruce and lodgepole pine, with some red fir and limber pine. The material used had been burned from one and one-half to four years. The Engelmann spruce was excellent, and the lodgepole pine also gave good results. The fire seasoning had driven the odor out of the pine so that it could be used for packing crackers and biscuits. Also, on account of the perfect seasoning the boxes remained tight when put up and therefore sold better than green boxes.

Effect of Boxing Yellow Pine.

What is the effect of "boxing" or "bleeding" yellow pine as regards its strength and durability?

Opinions differ in regard to the effect of removing turpentine from growing timber, but it has been established by government forestry reports that the strength of the timber is not impaired. This bleeding of trees affects only the sapwood and investigations made, prove that neither the bending nor the compressive strength of bled sapwood timber differs from bending or compressive strength of unbled sapwood timber. The claim has been made that tapped wood will not last as long as untapped, but this is a matter which is open to question, as considerable evidence exists tending to show that the durability of the wood is not affected by the process of bleeding.

Kinds and Quantities of Washington Timber.

What kinds of timber are native to Washington and what is their aggregate amount in feet, board measure?

Extensive investigation of the timber of Washington made by the United States geological survey in 1902 gives the following species and amounts in feet of timber standing in that state at that time:

	<i>Feet, B. M.</i>
Red fir	90,593,000,000
Hemlock	40,571,000,000
Cedar	22,646,000,000
Yellow pine	13,082,000,000
Amabilis fir	8,788,000,000
Spruce	8,221,000,000
Larch	4,776,000,000
White fir	1,780,000,000
Other species	4,780,000,000
Total	193,237,000,000

Timber and Stone Act.

What was the timber and stone act?

The timber and stone act was passed June 3, 1878. It was intended to distribute the public timber and mineral lands of the United States. Under this law neither residence nor cultivation of the tract entered was required. An application was made at the local land office within whose jurisdiction the tract was situated for the purchase of 160 acres of land or less, which was alleged to be chiefly valuable for timber or stone. The tract was advertised for sixty days, the date being mentioned at which evidence would be received by the local land officers to prove the character of the land. On the date specified, if the evidence was deemed sufficient and there was no opposition or allegation of fraud, the transaction was closed upon the payment of \$2.50 an acre and patent for the tract

was thereafter issued to the purchaser. The only grounds upon which a qualified entry would be refused would be that the land was not chiefly valuable for timber or stone or that the entry was being made for speculative purposes. The government did not contemplate the possibility of this legislative provision being used for the acquirement of large timber hold-

CORRECTION.

The statement made in regard to the repeal of timber and stone act is in error. The bill passed by the Senate on March 17, 1904, was referred to the committee on public lands, of the House of Representatives, and never reported. It did not, therefore, become a law.

Where to Get Information on Canadian Timber.

Where can I get information in regard to timber lands in Canada and the British Northwest?

There are some private timber holdings with which the provincial government has nothing to do, but most of the timber is sold by the crown, which issues a permit to cut timber from certain limits. In the eastern provinces the timber is sold at public auction, an upset price being placed on it before the bidding begins. Crown dues of so much a square mile are paid yearly, in addition to which the price of the timber must be paid when the stumpage is cut or in such manner as the provincial officials require. Information regarding

timber lands can be obtained from the secretary of any of the provinces.

Frost Cracks in Standing Timber.

What causes frost cracks in timber and in what manner do they injure it?

Severe frost causes what are known as frost cracks on the trunks of large trees. These ruptures reduce the technical value of the trunk, which in time becomes fit only for cordwood. The cracks are caused by the contraction of the wood under the influence of cold. When subjected to a low temperature the cells of the wood lose part of their moisture by its being transmuted into ice. The effect of severe cold is consequently the same as drying; that is, contraction of the wood results. Since the contraction is in the direction of the circumference of the tree, and of the medullary rays, the cracks always run lengthwise of the tree. If the contraction was uniform in all directions no contraction would occur. The outer layers of the wood are richer in water, and its increased volume when congealed helps the primary cause of cracks. The contraction of the wood begins when the temperature reaches the freezing point and proceeds in direct ratio with the decrease in temperature. On thawing the wood regains its original volume. Deep frost cracks are not formed at once, but a crack hardly perceptible at first gradually increases with the decrease of temperature. The formation of frost cracks is not affected by severe and prolonged frosts so much as by sudden drops in temperature following thaws. In any event cracks probably never form before the temperature falls to 20 degrees.

Isolated trees are more subject to frost cracks than those in dense forests. In large, old trees frost cracks

occur oftener than in young and slim growths. Cracks are found most frequently on the southern and eastern sides of the trunk, and extend from the bottom to the top of the tree, some reaching almost to the pith. When warm weather returns the cracks close and are covered over to such a degree as entirely to disappear. Under the action of frost in following years they reappear and become deeper. Frost cracks are the starting places of rot, since water fungi and insects easily find lodgment in them.

Lumbermen are all familiar with what are called frost cracks in timber. They are often greatly damaging to lumber cut from logs thus rent by frost. Hardwoods, with large pith rays, like oak, ash, maple and beech, are particularly subject to frost cracks. Conifers are less subject to crack, only spruce and fir having frost cracks frequently.

Quantity of Timber in the United States.

How much timber is there in the United States?

It is impossible to say with absolute accuracy what the amount of standing timber in this country aggregates. Estimates of reliable authorities vary considerably, but taking into consideration the increase which will occur in the present generation, its figures may be placed at 2,000,000,000,000 feet, board measure, of merchantable lumber.

Sale of Public Land Timber.

How is timber on public lands of the United States sold?

Public land timber sales are conducted under a law which was the outgrowth of a bill introduced by Senator Quarles and which was passed March 17, 1904. It authorizes the secretary of the interior to sell such

timber as he may elect to the highest bidder, after having such timber duly appraised and after having given public notice of the time, terms, manner and place of the sale. The secretary of the interior is authorized to reject any or all bids. In selling timber or timber land the custom is that after appraisement has been made a minimum price a thousand feet or an acre be fixed, below which no bids will be considered.

High Taxation of Timber Lands.

Is a policy of a high rate of taxation on standing timber profitable to the government?

Taxes are imposed by the states in which the timber is located. The usual result of a high tax is to force the owner of the tract to convert the timber into lumber as quickly as possible. The state receives a large revenue for a very short period. In many cases after the timber has been taken off the revenue to the state ceases entirely. It therefore is doubtful if as much money is turned into the government coffers as there would have been under a tax rate which would have allowed the continuance of the saw mill operations by reforestation.

Canadian Timber Dues.

What was the date of the fixing of the crown dues for timber cutting in Canada?

The crown first began to collect timber dues in Ontario, Canada, in 1826.

Newfoundland and Labrador Timber Regulations.

What are the crown regulations covering lumbering in Newfoundland and Labrador?

Under the law as it now stands timber licenses are issued at a bonus of so much a square mile. The amount

is fixed according to the location and value, but in no case is less than \$2. In addition to this there is an annual crown rent of \$2 a square mile and a royalty of 50 cents a thousand feet for all timber cut, except in Labrador, where the royalty is 25 cents a thousand. The one to whom the license is granted binds himself to build a saw mill with 1,000 feet a day capacity for every five square miles of the limit or to establish a plant which will be considered the equivalent of such saw mills. Limits for the manufacture of pulpwood may be obtained for not less than five nor more than 150 square miles at a first cost and \$5 a square mile with additional annual payments of \$3 a square mile. In this case the licensee binds himself to the building of a \$20,000 plant.

PART XII.—FORESTRY.

Beginning of American Forestry.

What was the first attempt at forest conservation in the United States?

In 1730 Jared Elliott, of Guilford, Conn., in partnership with Governor Bulkley, of that state, and a Mr. Livingston, of New York, started a small blast furnace at old Salisbury. The charcoal for the furnace was procured from the neighboring woodlands and it is recorded that only the large trees were cut, the small growth being left standing. Tradition has it that under this system cuts were made over the same ground for twenty years, in fact, are still being made. From this date spasmodic attempts were made at scientific conservation of tree growth by states and individuals.

First Forest Regulation.

What were the first forestry regulations in the United States?

In 1639 Hampton, N. H., appointed three men, called wood's wards, who had charge of the woods and who assigned to each head of a family what he might cut. March 8, 1709, it was voted that no man should fell any pine of the common which was to be hewed and sent out of town under penalty of 10 shillings a tree, the timber itself to be forfeited, half to go to the informer and the other half to the town.

First National Forestry Regulations.

What were the first forestry regulations made by the federal government of the United States?

It was not until 1882 that the efforts of far-sighted lumbermen crystalized into a potent organization. In that year the American Forest Congress (afterward known as the American Forestry Association) was organized at Cincinnati, Ohio. This association now has nearly 3,000 members and includes representatives from every state, from Canada and from foreign countries.

Authority was given to the president to set aside national forest reserves by an act of Congress approved March 3, 1891. The agitation which resulted in the present forest service may be said to have had its origin at the annual meeting of the American Association for the Advancement of Science held at Portland, Me., in August, 1873. At this convention a committee was appointed to send a memorial to Congress and to the several state legislatures urging the importance of promoting the cultivation of timber and the preservation of the forests and recommending proper legislation looking to these results. The memorial, with a special message from President U. S. Grant, was transmitted to the Forty-third Congress, thence to the committee on public lands in both the Senate and the House. The bill was favorably reported by the House committee and a recommendation made for a commission of forestry, but no action was taken by the Congress. At the next Congress, the Forty-fourth, a similar bill was introduced by Honorable Mark H. Dunnell, member of Congress. This bill was not made a law but an amendment was made to the act providing for an appropriation for the government expenses for the fiscal year ended June 30,

1877. This amendment was approved and in it was a clause providing that the commissioner of agriculture appoint a competent man with a view to ascertaining the annual consumption, importation and exportation of woods and their various products, the probable supply for future wants, the means best adapted to the preservation and renewal of forests, the influence of forest on climate, and all the measures taken in foreign countries for the preservation of forests and restoration of forests, which information was to be reported to the commissioner of agriculture and by him to Congress. Dr. Franklin B. Hough, of Lowville, N. Y., was appointed and the appointment was continued annually without further special appropriation than the \$2,000 a year originally set aside for the work until 1881. In that year a special appropriation was made for an established administrative division in the department of agriculture.

In 1883 N. H. Eggleston, of Stockbridge, Mass., became chief of the Division of Forestry and continued in office until March 15, 1886, when B. E. Fernow was appointed to that position. Dr. Fernow was the first practical forester, he having been employed in the Prussian state forestry department.

The division of forestry was afterwards known as the Bureau of Forestry, but in 1905 the name was changed to the Forest Service. It always has been a part of the department of agriculture. As it now exists the Forest Service is an immense organization, with administrative authority over the reservations belonging to the federal government. It has been of incalculable benefit to the lumbermen of the United States by giving them the results of its practical experiments, constantly carried on in all sections and dealing with all woods not only in regard to their

planting and development, best methods to be pursued in cutting them, but covering the uses for which they are best adapted or to which it is possible to put them. The service is under the efficient direction of Gifford Pinchot, chief forester.

Aid in Accomplishing Policy of Forestry.

What would be the greatest aid in the accomplishment of a policy of practical forestry?

Undoubtedly the chief obstacle to the cause of preserving the forests and renewing them is the heavy annual tax now levied upon them. If timber were taxed by the crop, as agriculture is taxed, it would result in an immense amount of good to the forestry cause. When a man owns a stand of merchantable timber upon which he is obliged to pay a heavy yearly assessment and for which the lumber markets are offering good prices, the incentive to cut and manufacture the timber is very strong, and any inclination which he might have to seek to continue his operations for as long a time as possible is discouraged by the amount of money which he would have to pay out annually to permit of the accomplishment of his purpose. When it comes to reforesting an area of cutover land the handicap is even greater. The forester is asked by the government to pay a tax for from twenty to forty years upon property which during that period will yield him absolutely no returns. It is argued that if the tax assessment, as it affects timber lands, were changed so that taxes would be collected only when the timber crop had been harvested and were based upon the value of that timber crop, the lumbermen would be much more likely to seek to reforest cutover areas and to follow out the

most advanced ideas in conservative tree cutting. It is believed, too, that in the end the government would receive a greater amount in taxes, as lumbermen would be encouraged to replant cutover areas and thereby contribute a tax, whereas under the present system they are likely to allow the land to remain unproductive to either themselves or the government.

Forestry Defined by Statesmen.

What is the relation between forestry, conservation of water supply and protection of agricultural land from floods?

These matters are summed up in the following excerpts, the first being from a speech of Grover Cleveland, former president of the United States; the second from Gifford Pinchot, head of the Forest Service, and the third from Theodore Roosevelt, president of the United States:

Through the teachings of intelligent forestry it has been made plain that in western localities ruinous floods and exhausting drouths can be largely prevented, and productive moisture in useful degree and needed periods secured by a reasonable and discriminating preservation of our forest areas; the advocates of irrigation have been led to realize that it is useless to provide for the storage of water unless the sources of its supply are protected; and all those who, in a disinterested way, have examined these questions concede that tree growth and natural soil on our watersheds are more valuable to the masses of our people than the footprints of sheep or cattle.

The first forestry reserves were made for the general object of preserving the forest and without specific relation to the great problem for which later they were to provide the only solution. Now they are seen to stand at the center of public land policy of the nation, for out of them come the wood and the water and the grass which are indispensable for the founding of homes.

The fundamental idea of forestry is the perpetuation of forests by use. Forest protection is not an end of itself;

it is a means to increase and sustain the resources of our country and the industries which depend upon them.

The wise administration of our forest reserves will be no less helpful to the interests which depend on water than to those which depend on wood and grass.

Duties of a Forester.

What are the duties of a forester; and where can I obtain copies of the literature being sent out by President Fellows, of the University of Maine, in regard to forestry as a profession?

Copies of the printed matter mentioned can be obtained by addressing the president of the University of Maine. Forestry has been termed the "new profession," which characterization applies only to this country. It has been practiced in other parts of the world for centuries. The number of foresters employed by manufacturers is limited, but there soon will be a demand for well equipped, practical men to look after the timber owned by manufacturers. As applied to the lumber industry the duties of a forester would be to look after the woods operations. He would decide what size trees and what percentage of the stand should be cut; what seed trees should be left; when the timber should be felled, and how the slashings and refuse should be cared for. He would exercise close personal supervision in order to see that the logging crews carried out the plans formulated so as to yield a profit to the employer. He must be a practical man able to show results, largely computed in dollars and cents. The forestry department in connection with large saw mills is making its advent and soon will be an important feature of the business. A consulting forester soon will be as well recognized as the consulting engineer, and they will work in a measure along parallel lines.

Second Crops of Northern Pine.

Do you know of any operators in the north who have cut more than one crop from pine lands?

Were full information at hand it probably would show that a great many pine manufacturers in Michigan, Wisconsin and Minnesota have cut more than one crop of logs from the same territory. In the early days only the best of the timber was cut and when the remaining timber later became valuable the operators probably made a greater profit from its conversion into lumber than on the first cutting. In the Peshtigo, Wis., district, one company is said to have cut pine from lands which previously had been logged over twice before. The first time the land was cut over it was thought all the pine of commercial value had been removed. Subsequently another crop was taken off, consisting largely of timber rejected by the first loggers, either on account of small size or inferior quality. The last operation took what remained of the white pine, norway, and probably some of the hemlock and hardwoods as well.

A Policy Acceptable to All.

What kind of policy relative to the forests do you think would prove satisfactory to all interests?

An elastic forestry—one that will permit the use of the lands withdrawn. There is not a state in the Union or a community in any state which does not concede the necessity of forest reserves. As a usual matter, this necessity exists only in connection with some other state and is not required in the commonwealth in which one's own community is located.

If some one will devise a forestry reserve policy that will conserve the timber of any given section, and permit it to be utilized; that will keep intact its

stone and mineral resources, while allowing them to be removed; that will permit stockmen to use such lands for grazing purposes, and the agriculturists to sow and reap two or three crops a year, and not interfere with the effectiveness of the forestry reserve, the AMERICAN LUMBERMAN will guarantee to have it adopted immediately as the only true and logical solution.

As a rule the individual of this country is heartily in favor of forest reserves. Usually he would like to see such reserves established in a desert or the center of the ocean, or some other equally non-interest-conflicting spot, but when such unjust discrimination is shown as to select the sources of water supply in his neighborhood, or the timber land that he might utilize, he develops a severe attack of Missouri mule locomotion and kicks.

Second Growth on Yellow Pine Lands.

What is the nature of the second growth timber on yellow pine lands in the south?

Scrub pine and oak as a rule replace the first crop on the cutover lands. In some sections pine of good quality is reproduced. A Mississippi operator said relative to this question that second growth in central Mississippi country in the main is very different from the original forest. "Where we have cut the pine clear the second growth is scrub oak and where we cut the hardwoods from the delta lands and the land afterwards becomes impoverished a growth of scrub pine takes the place of the original hardwoods. I think, however, the growth of scrub oak on cutover pine lands is due to the fact that the young seedlings are not protected. If proper precautions were taken and all of the trees not cut—a few trees for

seeding purposes left—the results would be different.

“I have not noticed any particular instance where abandoned farm lands have produced pine, but I have seen wild lands which were cut over twenty years ago yield as much timber now as they did when they were first cut. Of course that is under very favorable conditions. I must say, however, that twenty years ago we would not cut the same class of timber that we do today, because it was not marketable, and this also has a bearing on the question.

“There is one thing of importance regarding the setting aside of lands in order that a second growth may be secured. There has been, as I stated, a gradual increase in the demand for agricultural lands owing to the growth in our population. The lands which are most suitable for farming purposes have been taken up as a general thing, so this further demand for them must be supplied from the forest area. As an instance, where we started milling operations twenty years after the civil war there were large areas of idle lands which had not been reclaimed. Naturally, these lands were the first to be utilized again for cultivation, but such encroachments did not cease there but big inroads have been made upon the pine forest areas and any further increase for agricultural purposes must come from the forest acreage.”

Forestry in Russia.

Is forestry practiced in Russia, and, if so, how and to what extent?

Russia employs 20,000 rangers to protect her forests. About one-third of them are Mennonites, a religious sect with representation in the United States. These rangers work under the supervision of expert foresters. January 1, 1898, the area under superintendence of

the forestry department was 234,489,366 desjatans. A desjatan is equal to three and seven-tenths acres, which brings the forested area according to our measures to about 867,610,000 acres. Russia has vast unexplored forest areas, but is looking ahead and making plans for their preservation in advance of the devastating woodsman's ax. A feature of the forestry work in Russia is the collecting of pertinacious seeds which are preserved until needed for planting.

Organization of Russian Forestry.

When was Russian forestry work first placed under a practical system of management, and to whom was that management given?

March 4, 1797, the Board of Imperial Economy was established to assist the admiralty board, and the system of forestry control assumed somewhat its present form. The officials and their annual salaries at that time were as follows, a ruble, it will be remembered, being practically equivalent to 50 cents (51.5 cents):

	<i>Rubles.</i>
First senator	3,000
Second senator	2,500
Four directors, 1,875 rubles apiece.....	7,500
Manager of the chancery.....	1,500
Four secretaries at 750 rubles apiece.....	3,000
Executor	750
Interpreters, librarians, bookkeepers and watchmen.....	15,000
Twelve young noblemen students, at 100 rubles.....	1,200
General chancery expenses.....	3,000
Total	37,450

In addition it may be interesting to note that on March 12, 1798, the local forest commission had in its employ forty foresters, with annual salaries rang-

ing from 600 to 750 rubles; forty secretaries at 250 to 450 rubles; eighty clerks, with salaries of from 80 to 100 rubles, and 160 copyists at 50 to 60 rubles.

In the government forests there were also employed 160 foresters at a salary of 250 to 300 rubles, 320 students, two to each forester, at 80 rubles, and with a joint general allowance of 50 rubles for miscellaneous expenses; also 124 land surveyors with salaries ranging from 300 to 400 rubles, with extra individual allowances of 60 rubles for the purchase of paper and ink and of 60 rubles for the purchase of instruments. The upper foresters were provided with four horses each and the foresters with two horses, and were allowed extra for the support of their horses, and besides were supplied with building material required for the erection of houses, stables etc.

Russian forest reserves are greater than those of any other country in the world and with the extension of Russian railroads there undoubtedly will come a great increase in the manufacture of lumber and that country will prove the chief competitor of the United States in European lumber markets. In fact, Russian oak is already a very strong factor in the trade of Germany and several of the other continental countries of Europe.

Forestry Penal Regulations in Russia.

What are the Russian penal regulations as related to the forest, and to what extent does the government cooperate with individuals in forestry matters?

In Russia the penalty for stealing wood or maliciously felling trees is a fine of not over 50 rubles (\$25.65) and three months' imprisonment, in addition to restoring to the owner of the forest twice the actual amount

of the wood stolen, or cut down. This is for the first offense. For unlawfully grazing cattle or taking brushwood in a protected forest, the guilty party is subject to a fine not to exceed \$5. Forest guards in the employ of private parties wear a star and have equal police rights with government forest guards. Upon obtaining a permit from the forestry department any private owner can invite department experts to visit his tracts and confer with him on economic forestry methods. A permit is simply to enable the government to make a record of whatever is being done for its own statistical uses. The law compels any one noticing a forest fire to inform the nearest settlers and secure immediate assistance, also at the earliest possible moment to inform the owner of the forest. Where the police and forest guards are unable to extinguish the fire upon the day of its being noticed, a second call is sent out which it is compulsory upon the peasants within a radius of sixteen and a half miles to answer, who must serve without pay. Where the peasants are called from a greater distance than this, the owner of the forest is compelled to pay them a daily wage.

Forestry in the Black Forest.

What is the forestry policy pursued in the Black forest of Germany?

In the Black forest, Germany, the management is such that no tract is allowed to be completely denuded. This is especially the case in the portions in which grow the silver fir, a tree that no amount of suppression, such as the dense shadows cast in a thickly wooded area, affects. As soon as part of the trees are cut down, those previously dwarfed at once •

spring up, casting seed on all sides. The silver fir is usually cut at the age of 100 years, although sometimes it is allowed to stand double that time, at which age it stands 160 to 180 feet high. Not all the Schwarzwald forest has been preserved, however, some tracts having been cut out and the land used for agricultural or mining purposes.

Norwegian Forestry.

Are there any forestry regulations in Norway?

The most important law passed by the Norwegian government in relation to forestry is that which compels the planting of three trees for every one cut down. It is said that in that country by the time a man gets to the end of a tract of timber, his son begins on the new trees at the point where his father started operations.

Creation of a Forest Reservation.

What course is pursued by the federal government in the creation of a forest reserve?

Forest reservations are set aside by the president of the United States, which action is usually the result of a request or suggestion by the secretary of the department of the interior. Sometimes the secretary is actuated to make the request to the president by a petition from the people of the section concerned, who wish the reserve established for the conservation of water supply, or for some other reason. Sometimes the secretary of the interior appoints a committee to report on the selection of lands for national reserves and a report of this committee then forms a basis for the recommendation of the secretary to the president.

When it has been decided to make a forest reservation the land expected to be included therein usually is withdrawn from entry pending an investigation by government experts as to its character. The idea is not to incorporate lands suitable for agriculture within forest reserves except where such inclusion cannot be avoided.

PART XIII.—TRANSPORTATION.

Entire Car Must Be Accepted or Rejected.

Where lumber is sold and delivered by rail and the shipper unloads the car, can he make use of part of the lumber and reject the balance on the ground that it is off grade?

Ordinarily the use of part of a car of lumber will be deemed an acceptance of the shipment, and while it is not always safe to foretell the decision of a court in a particular case, unless other circumstances appear during the trial, it probably would be safe to predict that the shipper could recover for the entire car.

Carriers Can Not Refuse Shipment.

Can a railroad company prevent the movement of ties over its line in order to conserve the supply for its own use?

In 1905 the Interstate Commerce Commission held that where a railroad company refused to furnish cars for the movement of ties when it could have done so and to publish freight rates covering such movements, not because the hauling of the ties would not yield a reasonable profit but because it wished to retain a supply for its own use, an operator thus discriminated against would have action for damages.

What Constitutes Delivery?

Does the putting of a carload of lumber on the sidetrack where it is to be unloaded by the consignee constitute delivery?

It constitutes delivery in a measure only. If all or

part of the lumber were allowed to remain in the car the railroad company's responsibility as a warehouseman would still hold, and as its duties regarding the shipment not having been completed the courts would hold that its rights were still in force. Thus its right of demurrage charges, in case the car were not unloaded within the time specified and recognized as the legal period within which unloading must be done, would hold whether the car were on the main track or upon the private spur track of the consignee.

Transcontinental Government Railroad.

Who was it proposed a government owned transcontinental railroad, New York to San Francisco, and how was it to be operated?

The proposition was made by William J. Coombs, a hardheaded business man of New York. He was then chairman of the advisory board of the Title Guaranty & Trust Company of Brooklyn, one of the largest concerns of its kind in the country, so he can not be classed as a man who has allowed theory to get the better of his judgment.

It is claimed that it is just as practicable for the government to build a railway from ocean to ocean as it is to foster and protect the digging of the Panama canal—that the two projects are of the same character.

In a speech made before the Manufacturers' Association of New York Mr. Coombs pointed out the tendency in railway circles to consolidate lines and to put matters in such condition that a few men practically control and direct the transportation of the country, in support of which he quoted from the recent report of the Interstate Commerce Commission, saying

that "the railroads now possess the power to tax unjustly every other species of property."

The idea is to construct a double tracked line from ocean to ocean which could be used by any firm or individual for a consideration. Trains would be operated by government schedule, but it is not the intention, according to the planned outline, for the government to own and operate rolling stock. Rather the privilege of running a train over the line would be given and the one who desired to use the road in that manner would have to furnish his own motive power and cars.

Carrying Lumber by Flume.

Have you at your disposal information as to the operations of flumes for carrying lumber from a saw mill to a railroad track in mountainous regions? We are anxious to ascertain if any of six miles or more in length are in successful operation; what the sizes of the flumes are; whether flat box or V shape; what dimension of lumber is used for the trough and what for the supports; whether a V shape flume, say three feet across, would carry deals, heavy plank, poplar squares and railroad ties; also whether tanbark has ever been floated in them.

A number of big operators on the Pacific coast use flumes to carry their lumber from mills to railroad stations. Flumes are used successfully by the Bridal Veil Lumbering Company, Bridal Veil, Ore.; the Fresno Flume & Irrigation Company, Fresno, Cal.; the Sierra Lumber Company, Red Bluff, Cal., and several other concerns whose timber is located away from the railroad and which cannot be reached by rail without spending more money in the work than circumstances would justify. The flume operated by the Bridal Veil Lumbering Company is about four miles in length and the lumber is carried from the mill on the mountain to

the planing mill at Bridal Veil in about fifteen minutes. The grade is very steep and the average speed is something like a mile in $3\frac{1}{2}$ minutes.

Lumber flumes on the coast have proven satisfactory wherever they have been installed, though it costs a considerable amount of money to put in a flume, especially one like that operated by the Fresno Flume & Irrigation Company, which is forty miles long. This flume carries about 40,000,000 feet a year. It requires about seven hours for the lumber to reach the terminus after it has been put in at the mill. The flume is built in the shape of a V and on steep mountain grades the sides are made of two 16-inch plank and on the level plain of three 16-inch plank. This flume is used not only to carry lumber but occasionally a V-shaped contrivance is built and passengers are sent down, requiring five to six hours to make the trip, so it should be easy to transport tanbark in this manner.

A V-shaped flume three feet across, as suggested by the correspondent, providing there was sufficient fall, should carry anything that was put in it in the way of lumber, and it is somewhat surprising to see what short turns can be made and the lumber carried forward without interruption.

A flume can be built on ordinary trestle work, which must be substantial enough to bear the weight of the water and lumber carried by it. The Fresno flume varies from a grade or drop of one inch to as much as eight inches in sixteen feet, and of course any flume built must have a continuous drop in order that the water may carry the lumber.

The flume system, at least as a successful operation for the transportation of lumber, is entirely a Pacific coast proposition. In the east the lumberman has always chosen to transport his logs to a milling cen-

ter rather than to attempt the carriage of the lumber out to lines of transportation after it was manufactured. The eastern lumberman in rough sections employs timber slides in many instances for taking his logs from precipitous hights. Also in many cases he utilizes splash dams, where at short distances on small streams dams are built, and by opening gateways tides of water rush out that drive his logs down to the next level. However, physical conditions may exist in the operation of our correspondent which would make fluming a profitable method of carrying his lumber out to transportation lines.

Earliest Rafting on the Hudson.

When was lumber first rafted on the Hudson river?

The earliest authentic record of rafting on the Hudson river was made in 1768, but no names of the operators are given. Probably the Hudson was used for rafting before that time, but no proof remains. The river was not much used for rafting below Albany, because in order to make any progress it was necessary that both wind and tide should be favorable. At Albany, therefore, the lumber was loaded on sailing vessels for points to the south.

Largest Carload of Yellow Pine.

What is the record carload for yellow pine?

March 17, 1903, the C. J. Carter Lumber Company, of Draughon, Ark., loaded and shipped to the Boeckler Lumber Company, St. Louis, Mo., Chicago & Alton car No. 79,557, containing 40,079 feet of No. 1 yellow pine dimension, surfaced sides and edges to 1½ inches. This is believed to be the largest yellow pine carload to date.

Largest Carload of Hemlock.

What is the biggest load of hemlock lumber ever put on a car?

In January, 1903, the Robert Jenks Lumber Company, of Cleveland, Ohio, shipped Baltimore & Ohio car No. 22,288, containing 43,624 feet of hemlock boards, which is the largest recorded hemlock load to date.

A Big Load of Red Oak.

What is the largest carload of lumber on record?

June 19, 1902, the Wausau Lumber Company, of Edgar, Wis., shipped to the Mattoon Manufacturing Company, Sheboygan, Wis., Chicago & Alton car No. 21,332, containing 30,763 feet of red oak. This wood is supposed to weigh 4,000 pounds to the thousand feet, which would bring the load to about 123,000 pounds. The capacity of the car was 110,000 pounds, but the load was legitimate, as an allowance of 10 percent over the car's published capacity is made by railroads.

The Best Lumber Car.

What is regarded as the most advantageous box car equipment for a railroad which handles large quantities of lumber?

The interior of the average box car equipment built today is 8 feet wide, $7\frac{1}{2}$ feet high, 34 to 40 feet in length. These cars have a carrying capacity of from 60,000 to 80,000 pounds, and in some cases 100,000 pounds. If a 40-foot box car were loaded solid with dressed white pine $\frac{3}{4}$ -inch thick it would contain approximately 32,400 feet and, estimating two pounds to the foot, would weigh 64,800 pounds. Of rough white,

pine it would contain 28,800 feet, which, estimated at $2\frac{1}{2}$ pounds to the foot, would weigh 72,000 pounds. However, lumber of that length is seldom if ever shipped. If a car of this length were loaded with dressed white pine 16 feet long it would carry 25,920 feet, which estimated at two pounds to the foot would be 51,840 pounds; or of rough 16-foot lumber it would contain 23,040 feet, which estimated at two and one-half pounds to the foot would weigh 57,600 pounds. This would leave 8 feet waste room in the center of the car.

If this sized car were loaded with dressed norway pine, one-half 16-foot and one-half 18-foot stock, it would carry 27,600 feet, which estimated at three pounds to the foot would weigh 82,800 pounds. If the lumber were rough the car would carry 24,840 feet, which estimated at three and one-half pounds to the foot would weigh 86,800. In this case there would be 6 feet of waste space in the center of the car. The same result would be obtained when loaded with short-leaf yellow pine, as it weighs approximately the same as norway.

If this sized car were loaded with dressed longleaf yellow pine, one-half 16-foot and one-half 18-foot, it would carry 27,600 feet, which estimated at three and one-half pounds to the foot would weigh 96,600 pounds; or if rough, 24,840 feet, which estimated at four pounds to the foot would make a load of 99,260 pounds. Still there would be 6 feet of waste space in the center of the car.

It will therefore be seen that covering the ordinary board lumber product of the country, a 36-foot car would meet all requirements.

Of cars devoted to the white pine trade a capacity of 60,000 would be best, and for sections shipping yel-

low pine an 80,000-pound car would be desirable. There is ordinarily no advantage in cars for general lumber purposes being over 36 feet in length, as they will carry full capacity and the extra expense of building 40-foot cars and the dead weight carried are a loss in this class of traffic.

Shippers' Rights and Car Service.

Have any decisions been rendered fixing the legality or illegality of any of the state laws pertaining to car service charges? How should one proceed to enforce rights given shippers and receivers under these measures?

Herbert Hadley, attorney general of the state of Missouri, in an opinion rendered to the state board of railroad commissioners holds that the commissioners have no power to enforce the provisions of the Wornall demurrage bill enacted by the last legislature. This opinion is based on the fact that the penalty is prescribed in the law, as it provides that where cars are ordered, except for shipment of perishable fruit, live stock, coal and coke, the railroad companies must furnish cars within four days, otherwise a penalty of \$1 a day thereafter must be paid by the company to the person ordering the car. The railroad commissioners received a complaint from the Darlington Lumber Company, alleging that the provisions of the new law had not been obeyed.

This statement may lead to a belief that the demurrage law of Missouri cannot be enforced, but this is not the opinion of those who are acquainted with the provisions of the bill.

When suit is brought to collect any of the damages, penalties, forfeitures, demurrage or storage charges provided for in this act, said suit may be brought in any court in this state having jurisdiction

of the subject matter and parties under the then existing laws; and if plaintiff therein recover judgment such plaintiff shall also recover a reasonable attorney's fee for bringing such suit, to be taxed on motion and paid as other costs by plaintiff in such suit. It shall be necessary for the party or parties bringing suit against any railroad company under the provisions of this act to show by evidence that he or they had on hand at time any demand for a car or cars was made, the amount of freight necessary to load the car or cars so ordered.

Rates on Pacific Coast Lumber.

I have a friend looking for the following information relative to transportation charges on Pacific coast lumber:

1. What is the rate on lumber from Puget sound to Albany or New York by rail?
2. What are the rates from Puget sound to Duluth by rail and boat to Albany or New York?
3. Rail rates from Duluth to Albany or New York?
4. Water rates from Duluth to Albany or New York?
5. What is the carrying capacity in tons of a canal boat?
6. Canal rate on lumber from Buffalo to Albany?
7. Rail rate on lumber from Buffalo to Albany?
8. Do you know what are the water rates from Puget sound to New York on lumber via Cape Horn?

You can give the above rates by 100 pounds or 1,000 feet.

It is advisable to state at the outset that the western lines make a differential in favor of fir lumber, on account of its weight. On shipments to St. Paul, Duluth and Chicago the difference in the rates is 10 cents. The roads east of Chicago class all Pacific coast lumber under one head and charge the same rate to points in the east.

Lumber from the Pacific coast destined to points east of Chicago is shipped to Chicago, where it is rebilled to final destination, the eastern roads making

a lower charge than on lumber originating at or near Chicago. There are two exceptions to this practice, one being in the rate on doors, blinds and mill work, which now is \$1 a hundred from the Pacific to the Atlantic seaboard. The other is the rate on redwood, which is 75 cents for the transcontinental movement.

As we understand the situation, there are no through rates quoted from Puget sound to the Atlantic seaboard, the charge being based on the Chicago rate and the reduced tariff effective on lumber originating on the coast for eastern shipment. On that basis the rate from Puget sound to Albany or New York would include the rate of 50 cents a hundred on fir or 60 cents a hundred on other kinds of lumber, plus the local charge of 19 cents to Albany and 20 cents to New York city, making through rate on fir 69 cents to Albany and 70 cents to New York city and on other kinds of lumber 79 cents to Albany and 80 cents to New York city. The difference between the weight of fir and other lumbers, however, would do much toward making the freight charge on a thousand feet about equal.

Should the shipments be made to Duluth, thence east by boat the rate would be 40 cents on fir to Duluth and 50 cents on other lumber. From Duluth the lumber would go by boat to Buffalo, thence by canal to Albany or New York. The rate charged by the lake vessels is \$2.50 a thousand during the summer months, but near the time when navigation closes rates usually are advanced. The canal charge from Buffalo to Albany is given at \$1.75 a thousand and \$2.25 to New York.

Averaging the weight of Pacific coast lumber at 3,000 pounds a thousand feet, this would make the through charge by combination rail and water route

on fir, Seattle to Albany, $54\frac{1}{2}$ cents a hundred; Seattle to New York, $56\frac{2}{3}$ cents a hundred. On lumber other than fir the rates would be 10 cents higher to each point, a part of which difference would be made good by the lighter weight of spruce and other woods.

In order to secure the benefit of such rates it would be necessary to ship a full cargo, ranging from 500,000 to 1,250,000 feet, by the lake vessels. This lumber would have to be transferred at Buffalo to canal boats, which have a carrying capacity of about 175,000 feet, and whether or not there would be a charge for the transfer we are not prepared to state, but presume that some arrangement could be made whereby rates as above given could apply. The difficulty in moving freight in this manner would be in securing a full cargo at Duluth, the transshipping point. The smallest lake vessel, carrying a cargo of only 500,000 feet, would require about thirty-five carloads of lumber. It is possible that arrangements could be made whereby a full train could be brought into Duluth and the shipment made in that manner, but if such method were adopted it would be necessary to have a vessel on hand in order that time should not be lost in transferring the lumber.

Providing it was desired to put the lumber aboard cars at Buffalo or the Tonawandas for transportation to final destination, the rates in effect, $12\frac{1}{2}$ cents to Albany and 15 cents to New York, would make the through rate on fir, Seattle to Albany, $60\frac{5}{8}$ cents; Seattle to New York, $63\frac{1}{3}$ cents. The rate on other kinds of lumber would be 10 cents more than the rates above mentioned, but spruce, cedar and hemlock are lighter than the fir, so that the gross charge a thousand for carrying the lumber would not vary to

any considerable extent, should an average for the haul across the continent be made.

Regarding the movement of lumber from Puget sound to New York by vessel via Cape Horn, rates now in effect between the points mentioned range from \$12 to \$14 a thousand. The movement by this route is not heavy.

How to Avoid Overcharges.

In shipping goods we have adopted the method of enclosing a little slip giving the rate and the weight on which freight charges should be assessed, and this method has given good results. In receiving freight we generally have fought it out with the railroad company before the goods were handled and have succeeded in collecting to much better advantage. In shipments of lumber to this place we have had at least twenty cars overbilled in rates and weights. While in many instances we are not directly concerned, as the goods are sold delivered, we have succeeded in getting the railroad company to rectify the errors before the goods are received. We have during the last year had occasion to take the matter into the courts four or five times, but have had the claims adjusted. We certainly have kept after them and have been able to get along very well.

If properly instructed, the shipper should have very little difficulty in inducing customers to withhold freight charges until the freight had been assessed upon the correct weight and at the proper rate. It would not be possible to do this on all occasions, but where a mistake has been made in computing the rate or the weight of the lumber it would seem that the easiest method for all concerned would be to adjust the difference on the spot. By this method the shipper would not be deprived of the use of the money involved and the transportation line would have that much less clerical work to look after.

Free Time Allowance.

What is the free time allowed for unloading cars on the Pacific coast?

Since April 20, 1903, the rules of the Pacific Car Service Bureau have allowed seventy-two hours free time for the unloading of cars.

Free Time for Loading and Unloading.

When do demurrage charges begin?

In different sections the free time allowed for unloading cars varies, and also the time from which the free time is reckoned. As a general proposition the railroad companies begin to count from 7 o'clock on the morning following the receipt by the consignee of the notice of the delivery of the car at the point where it is to be unloaded.

Penalty for Failure to Supply Cars.

Is there any part of the United States where the railroad companies are compelled to pay shippers for not supplying cars within a specified time after an order for same has been placed?

In Virginia, North Carolina and South Carolina the railroad companies are compelled to furnish cars within a specified time from the date they receive the order for same or in default pay \$1 per day per car to the shipper; also they are compelled to move the cars an average of at least so many miles each day or in default pay to the shipper \$1 a day for each car not so moved. The regulations in the three states vary. In Virginia freight must be moved an average of fifty miles a day and cars must be furnished within three days from the date of the order. In North Carolina cars must be supplied within three days,

when the distance to be covered to the shipping point is not more than fifty miles, but the railroad companies are not required to move the cars more than twenty-five miles a day. In South Carolina railroads are allowed four days to furnish cars for loading. In all three states where accidents render it beyond the power of the railroads to furnish the cars or to move them the specified distances, the carriers are not subject to this charge. In these states shippers are allowed forty-eight hours in which to load cars after the expiration of which time the usual demurrage charge of \$1 per car per day is payable to the railroad companies. If the shipper fails to begin loading within the forty-eight hours the railroad company may consider the car released and charge \$2 demurrage thereon.

State and Car Service Demurrage Laws.

Do car service regulations and state demurrage laws ever come into conflict, and, if so, which governs?

At the present time state laws and the rules enforced or sought to be enforced by car service bureaus, often conflict, the state laws over-ride the regulations of the bureaus, but in order that the former may be enforced action has to be brought in the courts, so that in many cases the shippers and consignees have submitted to the car service regulations rather than go to the trouble and expense necessary to the beginning and carrying on of litigation to compel an enforcement of the statutes.

Rates on Carloads of Lumber.

A railroad company through its agent quoted a rate of 13½ cents a 100 pounds upon lumber between certain points. A shipper to whom this quotation was made sold

two carloads of lumber delivered, figuring the freight at the rate quoted. The railroad company collected a 16½ cent rate, the 13½ cent rate not having been put into effect, as had been intended at the time the rate was quoted. What recourse would the shipper have?

It would appear that the railroad company was obliged to collect the 16½-cent rate, that being the published and, therefore, legal rate between the points of shipment. The shipper in an action for damages would be able to collect the loss actually sustained by reason of the wrong quotation of the 13½-cent rate. This, however, would be a matter for the courts of the state in which the transaction took place. Proceedings before the Interstate Commerce Commission would avail nothing because the railroad company would set up the defense that the quotation was made through error and when the error was discovered the correct charge was collected.

Liability for Loss in Transit.

Where lumber is sold at a delivered price is the consignor liable to the consignee for loss in transit?

As a legal proposition, when lumber has been sold to a purchaser at a distance its delivery to a carrier is a legal delivery to the purchaser and the transfer of title is thereby completed, the carrier from the time of receiving the shipment and not the consignor being obligated for any loss or injury or for any delays in transit. This is where a bona fide sale has been made with no draft attached to bill of lading or any ulterior condition involved in the sale of the goods. In actual practice the consignee looks to the consignor to make good whatever loss or injury there may be and in turn claim is made by the shipper upon the railroad company. This practice is due to the fact

that the manufacturer has better facilities for handling such claims than has his customer. This phase of the situation, however, is not supported by the decisions.

Application of Wrong Rate.

Where a car of shingles is sold delivered at a 63 cent rate, and upon delivery the railroad company collects only 60 cents, who is entitled to the 3 cent difference?

Of course, if the railroad company makes a mistake in collecting the 60-cent rate, neither the buyer nor the shipper is entitled to profit by the error. It is as much the duty of either to notify the railroad company of an undercharge as it is the railroad company's duty to remit an overcharge. If the rate is made by a legitimate combination of local rates the shipper undoubtedly is entitled to any difference which may be due to his care in routing the car so as to secure the best possible rate.

Placarding Cars.

Is there any law prohibiting the manufacturer of lumber from putting a card on the cars he ships showing by whom the lumber was manufactured?

There is no state or federal law prohibiting the placarding of cars. Many of the railroad companies, however, have a rule, which sometimes is enforced, prohibiting the tacking of signs on cars loaded with merchandise of any description. Middlemen in some cases might object to their customers knowing by whom the lumber was manufactured, but they probably would not have any recourse by law. They might, however, quit buying from the manufacturer who used car signs for that reason just the same as for any other reason.

Flat Car Equipment.

Is there any practical way of providing standards for flat cars which will do away with the necessity of staking them with timber, which has become an item of considerable expense to the lumberman. If you have any information on this subject which you could conveniently send us, or could refer us to any association by which the matter has been discussed, we would be very grateful for the assistance.

Lumbermen of the United States for years have been endeavoring to secure relief from the burden incurred in equipping open cars for the shipment of lumber.

Several years ago a conference between lumber manufacturers and railroad officials was held in Georgia. Shortly after the Georgia conference the Florida legislature passed a law which provided that all open cars should be equipped with standards or supports for the transportation of lumber and providing a penalty where the railroads failed to supply the equipment. The full text of the law is given:

SECTION 1. It shall be the duty of every railway company or person engaged in the business of carrying for hire in this state to efficiently and suitably equip and supply every and all flat cars and cars belonging to such carrier and which may be furnished on which to load any cargo of timber or lumber with all proper and sufficient standards, supports, stays, strips, railing and other equipments and appliances necessary to hold and keep the cargo firmly in place.

SECTION 2. The standards, supports, stays, strips, railings, equipments, appliances, contrivances etc., provided for in the first section of this act shall constitute and be held and considered part and parcel of said cars and the weight of the same shall be added to the weight of the cars and shall be deducted from the weight of the cargo of lumber and timber shipped so that the freight charges shall be charged by the carriers on the cargo shipped only.

SECTION 3. Whenever any such carrier shall fail in the duty imposed upon it in respect of its said cars in the first section of this act and the unsupplied standards, supports

and strips and other proper equipments shall be provided by the shipper it shall be and is hereby made the duty of such carrier owning car to pay the shipper one and one-half dollars for each and every car to which it may be necessary for said shipper to supply or provide any such standard, support, strips or other equipments, as compensation to the said shipper for the same, payment of which said sum shall be made by said carrier to said shipper upon demand of said shipper made upon any agent of said carrier, and said shipper shall have a lien therefor on said car.

SECTION 4. This act shall go into effect January 1, 1904.

Some of the railroads refused to provide equipment, although ample time was given them to comply with the law.

Responsibility for Delayed Shipments.

There has been more or less agitation in the different states about compelling the railroad companies to furnish cars within a reasonable time after they are ordered and when loaded to haul to destination within some time limit.

It takes longer today to ship material from Michigan to an eastern point than it did when we started in business twenty years ago. An ox team is greased lightning as compared with the way freight is handled on some of the roads at present.

Virginia, North Carolina, Mississippi, Oklahoma, Washington and possibly some other states have laws which provide that requisitions for cars when made in good faith must be filled within a reasonable time—the limit being specified—or the railroad company is liable to a penalty for each day's delay. A majority of the regulations of this character are copied very closely after those of Virginia. In some of the states where the demurrage laws have been provided shippers have been benefited but in others those who originate bulky freight apparently are uninformed and do not take advantage of the rules provided for their protection.

Ownership of Lumber in Transit.

Who is the owner of a car of lumber after it has been billed out by the wholesaler and delivered to the railroad company; has the wholesaler the right to stop the car in transit and rebill it to a different consignee?

The title of lumber shipments by rail is held to pass when the bill of lading is issued by the railroad company. By the terms of the bill of lading the railroad is made the agent of the shipper, and for a consideration agrees to deliver, in the condition received, the merchandise called for on the bill of lading. In effect the bill of lading is similar to a warehouse receipt or certificate of deposit. It evidences a contract between the shipper and the consignee, and it has been held that the contract cannot be canceled unless the consignee becomes insolvent while the goods are in transit or agrees to waive his rights. In shipments of grain, however, the bill of lading frequently is used as collateral and pledged to secure loans. This is a common practice or custom, although the bills of lading frequently are stamped "not negotiable." As a general rule, however, cars in transit belong to the consignee and the shipper is not privileged to rebill them to anyone else.

Locomotive and Car Equipment of the United States.

How many locomotives and cars are in use on American railroads?

The Interstate Commerce Commission's eighteenth annual statistical report giving figures for the fiscal year ended June 30, 1905, shows 48,357 locomotives and 1,842,871 cars in service. Of the locomotives 11,618 were in the passenger service, 27,869 in the freight service, and 7,923 switching and 947 unclassified. Of the cars 40,713 were in the passenger service

and 1,731,409 in the freight service and 70,749 in the companies' service. These figures did not include cars belonging to private car lines owned by individuals or corporations. The aggregate mileage for the year was 218,101.04. Passenger locomotives were credited with an average of 2,048,558 passenger miles and freight locomotives with an average of 6,690,700 ton miles.

Collecting Car Service Claims.

Please suggest a way of collecting from the railroads car service claims which are too small to justify the expenditure of much money in litigation.

In cases where it is necessary to resort to litigation, a suit may be entered in a justice court where the expense is nominal and the judgment obtained will in most instances be final inasmuch as the railroad company, like the other litigant, would not care to invest enough money to take an appeal.

Team Tracks.

Will you please explain what is meant by a "team track"?

Team tracks are those which permit of the approach of a wagon for unloading. Sometimes they are called unloading tracks and in some localities the term house tracks is used to distinguish them from other side tracks which are not accessible by wagon.

Rate at Which Traffic Moves.

Some of the Atlantic coast states have recently passed laws to compel the railway companies to move cars a specified or minimum rate of speed a day. Will you kindly give us the names of these states? as we would like to get copies of their laws.

Bills having in view the regulation of the movement of freight and prescribing a minimum distance

which it shall be transported each day have been introduced into various state legislatures. So far as our records show, however, in only three states—North Carolina, South Carolina and Virginia—have such laws. In the first it is provided that shipments destined to a point within fifty miles of the station from which shipped shall be delivered within three days and additional time of one day is allowed for each additional twenty-five miles. In South Carolina four days are allowed. Virginia demurrage rules provide that all freight in carload lots or less shall be carried forward at a rate of not less than fifty miles a day.

Fifty miles seems to be the desired minimum at which freight shall be transported and numerous bills including a clause to that effect have been drawn up and presented, though they have not all been adopted; in fact, as will be seen, very few of the states have such regulations in force. A similar law has been added to the Mississippi statutes since the foregoing letter was written.

Virginia Demurrage Laws.

Could you give us the Virginia law relative to "insisting on shipments moving at least fifty miles a day by common carriers after they have received same"?

Copy of the Virginia demurrage regulations can be secured by making application to the state corporation commission at Richmond, Va. The Virginia rule relating to the movement of freight is given herewith:

When freight in carloads or less is tendered to a railroad company and correct shipping instructions given the railroad agent must immediately receive the same for shipment and issue bills of lading therefor; and whenever such shipments have been so received by any railroad company they must be carried forward at the rate of not less than fifty miles a day of twenty-four hours, computing from 7

o'clock a. m. the day following receipt of shipment, and for failure to receive and transport such shipments within the time prescribed the railroad company so offending shall forfeit and pay to the shipper the sum of \$1 per car per day or fraction thereof on freight in less than carloads, with minimum charge of 5 cents for any one package, upon demand in writing by the shipper or other party whose interest is affected by such delay; provided, that in computing the time of freight in transit there shall be allowed twenty-four hours at each point where transferring from one railroad to another, or handling of freight, is involved.

The period during which the movement of freight is suspended on account of accident, or any cause not within the power of the railroad company to prevent, shall be added to the free time allowed in this rule and counted as an additional free time.

North Carolina has regulations very similar to those of Virginia, which require that shipments destined for points fifty miles distant shall be delivered in three days and one day additional time allowed for each additional twenty-five miles or fraction thereof, the penalty being the same, \$1 a car for each delay of twenty-four hours.

Cost of Equipping Open Cars.

What does it cost the millman to equip a car with stakes for hauling his product?

The cost of such stake equipment, without figuring in the freight on the same, averages \$3 to \$5 a car.

Basis of Weight Schedule.

Was the rate on lumber always figured by railroads on the basis of 100 pounds?

Prior to 1877 lumber as well as certain other bulk commodities, was freighted at so much a carload, a carload usually being considered 20,000 pounds with a maximum of 24,000 pounds and a special rate for excess weight. At that time there was a bitter fight

on the part of Mississippi river cities from Minneapolis to St. Louis, for the control of the southwestern lumber trade, but while these cities were fighting among themselves they were ready to join hands in an effort to down the Chicago lumber shippers, that city making a strong bid for the trade of the southwestern territory. This competition led to the selection by each railroad of certain shippers who were "protected" in their efforts to get the trade. These "protected" shippers were allowed to load as much lumber on the cars as was considered safe and the freight charge was made on the basis of 24,000 pounds. Under this system the overweighing of cars became notorious and was the cause of continual controversies between the managers of the different roads. In 1876 J. W. Midgley was appointed commissioner of the Southwestern Railroad Association, which organization took in the Alton, Burlington and affiliated companies, the Rock Island and the Missouri Pacific. Because of the general overloading of cars Mr. Midgley introduced railroad weighers. To facilitate their work the weight schedule was altered to apply on the basis of 100 pounds. The advantages of this system of figuring freight were very apparent and the lead of the southwestern association was soon followed by the other roads.

When the Forty-Cent Rate Was Established.

When was the 40-cent rate from the Pacific coast put into effect?

The 40-cent rate on freight lumber to the Black Hills country, South Dakota, western Nebraska, Colorado, Wyoming and as far east as Minneapolis, was granted in October, 1900, by the Northern Pacific and

the Burlington railroad companies. Operators now want this rate to be extended to Missouri river common points.

Methods Used by Lumbermen.

I am not a lumberman, but am interested in transportation matters and would be glad to have you advise me relative to the methods used in the lumber business.

The lumber industry gathers up and adapts to its own uses probably every method of transportation that was ever discovered or used in the history of the world, and not infrequently one operation is almost an encyclopædic demonstration of invention along this line. Trees grow in almost every conceivable position and in many climates they are handled by labor of many nationalities and of diverse intelligence and energy.

The transportation of forest products is naturally divided into two principal parts—the carriage of logs from the stump to the mill and the shipment of their products from the mill. When the tree is felled and cut into logs the first problem is to get them to some roadway on which they can be moved some distance. This swamping, as it is called, is usually done by horses, mules or oxen, but frequently by power. If animals are used the logs will be snaked along the ground or mounted on low wheels or suspended between high wheels or sometimes put on a “frog” which is substantially a crotched stick, the two branches resting on the ground, making rude runners, while to the other end is attached the team.

The steam skidder also does this work. In one of its forms there is a suspended cable on which runs a trolley carrying the line, one end of which is wound up on a drum while the other end is attached to the

log. Other methods drag the log along the ground for shorter distances, also by power.

When the logs are gotten to a roadway of some description they are then taken to the mill, also by multitudinous processes, though sometimes instead of to the mill they are taken to streams whence they can be floated down.

In the northern white pine and hemlock country, winter logging has been to a large extent the rule. There the logs are piled perhaps fifteen feet high on broad sleds and drawn over ice roads. These are made by sprinkling the snow with water and cutting ruts by a machine made for the purpose, so that with carefully laid out grades as high as 25,000 feet or more of timber can be hauled by one team. Of most general use in lighter operations is now the logging railroad. Logs drawn into the track are loaded by horse or steam power. Sometimes wagons and traction engines are used.

In the heavy timber of the Pacific coast a favorite method is to fasten the logs together into trains, attach a cable to the foremost and drag them down to some point where they can be put on cars or otherwise taken to the mill. This method is used for distances up to one and a half or two miles. Another method is the log slide where the slope is precipitous. In some cases logs are hauled between the rails of the track by a locomotive. There have been instances where all these methods were used in one operation. In one case "portable donkey" engines brought the logs from the stamp to the skidways; there they were toggled together and hauled a mile and a half by a cable moved by a permanently installed engine to a point where gravity would take care of them. At the

end of the slide they plunged into a pond and thence were taken to the mill by rail.

In Pennsylvania a favorite method is to build a slide or trough lubricated with petroleum residuum in which the logs are placed loose. A horse is attached by a rope or chain to the rear of the last log and so pushes a quarter mile of them down to the mill. In some cases aerial tramways are used to take logs over deep ravines or over surfaces which are otherwise impassable. River driving involves moving the loose logs down a water channel, perhaps by the aid of flooding dams. Long distances on larger streams involve rafting.

From the mills manufactured lumber is usually loaded on the cars and shipped by rail, but in many cases there are preliminary processes. In some sections lumber is made into rafts and floated down rivers to points of distribution. On the great lakes lumber is sent to market by vessel and the same is the case all around our coast line. Often the mill, especially in the mountains, is so located that it is almost inaccessible to railroads, consequently a flume may be built, along which, aided by a flow of water, timber, plank and boards and other mill products slide to the storage and shipping point. These flumes vary in length according to circumstances, and the longest is about seventy miles.

This is an outline of some of the chief methods of transportation of logs and lumber. Pages could readily be occupied with a description of minor methods and details.

Lumbermen's Ideas on Demurrage Rules.

I am a car service man and naturally am interested in the views of lumbermen on car service rules. Will you

kindly outline for me the general attitude of lumber receivers and shippers on this point?

Lumbermen are in favor of any rule or any set of rules that will result in giving them prompt service. They believe their shipments are discriminated against in favor of commodities which pay a higher rate and that when it becomes necessary to set any cars out to lighten a train, lumber is selected and left behind. Several years ago a committee representing the Retail Lumber Dealers' Association of Mississippi and Louisiana presented the following as their views of the proper regulation of car service charges:

First—We beg to call your attention to the rules on the subject of demurrage, which we submit should be framed in the interest of the shippers as well as the railroads. We submit that the shipper should have credit for the time saved to the railroad company by his unloading cars in less than the free time granted by the rule. We further submit that if any time elapses between the arrival of goods and notice to the consignee it should be credited on any demurrage assessed against the consignee.

Second—We respectfully submit that where cars are not promptly furnished on written demand by shipper demurrage should be allowed against the railroad for each day of delay in furnishing cars at the same rate now assessed against the consignee for delay in unloading.

Third—We submit that where cars are properly loaded and notice given to the railroad, and bills of lading signed by the railroad, demurrage should be assessed against the railroad for each day of delay in moving said cars, and that such demurrage should either be paid in cash to the shipper or credited on demurrage assessed against him for delays in unloading.

Fourth—We submit further that one of the great evils with which shippers and consignees have to contend is the delay in transmitting cars from point of shipment to destination. This delay often occurs at the starting point, but more often is caused by delay in transferring cars between connecting lines. We think there should be an agreed average daily mileage for the travel of cars loaded with

lumber and its products, say twenty-five miles per day, and that where a car in transit makes less than twenty-five miles average per day, without accident or unavoidable cause, the consignee or shipper should be allowed demurrage for each day's delay or detention of said car in transit.

In regard to these requests we do not ask that the railroads pay the demurrage assessed against them in cash, but that there be a settlement of demurrage bills once a month and that the railroads credit the consignees or shippers with the amounts charged against the railroads on any amounts assessed in favor of said roads. We believe the above amendments asked for by us are directly in line with the provisions of rule 10 of the rules adopted by the Mississippi Railroad Commission and rule 6 adopted by the Louisiana Railroad Commission.

No Lien for Demurrage.

Do demurrage charges constitute a legal lien?

According to the supreme court of Illinois a lien can be created only by law and with the consent of the contracting parties. Demurrage charges are based upon the arbitrary rules of a railroad company to which neither the shipper nor the consignee has assented. Of course in the majority of cases both the shipper and consignee are aware of the existence of such regulations, but the law does not presume assent to the rules of the railway company for a lien for damages by delay in receiving the goods shipped from the publication of the same. It is believed that the right to lien for demurrage may be possessed by ocean-going carriers, but even in this case there is usually an agreement covering the point.

In the cases of the Cleveland, Cincinnati, Chicago & St. Louis Railroad Company against Lamm and the same appellant against Holden, the appellate court of Illinois decided that the carrier had no such right. In deciding such cases the courts frequently cited this law:

A lien for demurrage in favor of carriers by land is not implied by law and cannot be asserted except by virtue of an express agreement, or of a custom so recognized as to have the force of a contract. The rules and regulations of a railroad company providing for a lien for demurrage, though published, are not binding upon the consignor or consignee of goods without their consent, or the consent of one of them, when the contract for shipping the goods was made. Even the knowledge of such rules by the shipper or consignee, without consent thereto, does not bind him. The law does not presume assent to the rules of a railroad company, for damage caused by delay of the consignee in receiving goods shipped, from the publication of such rules.—Jones on Liens, vol. 1, sec. 282.

Car Equipment.

Where was the question of forcing the railroads to equip their flat cars with stakes for the loading of lumber first made a practical issue and what were the points brought out by both sides?

At Atlanta, Ga., December 1, 1902, the lumber interests of Georgia presented their case before a committee from the Georgia legislature. It was shown by the petition that the car stakes, labor involved in getting them out and the freight charged on them by the railroads in connection with lumber hauling within that state alone cost the lumbermen annually \$187,500. They claimed it was very unreasonable that they should be compelled to equip the cars with these stakes, the same being a total loss to them, and in addition should be compelled to pay freight on the stakes. The defense by the railroad companies was simply that it would be impracticable for them to equip their cars, as to do so would entail an expense of from \$50 to \$75 a car, and that as the lumbermen had been furnishing these stakes and paying these charges in times past they should continue to do so in future. This proceeding led to the railroads of

Georgia and Florida making an allowance of 500 pounds a car for the weight of these stakes and was one of the first steps in securing for the lumbermen recognition of the justice of their claims in regard to car stake equipment.

Equipment of Open Cars.

Who started the movement to compel the railroad companies to equip open cars with stakes and supports for safeguarding lumber shipments on this equipment?

This deserves to take rank among the impossible questions. Lumbermen have been protesting against the action of the railroad companies in compelling them to provide stakes and binders which with the cost of installing involves an expense estimated to range from \$3 to \$8 a car, for many years. Their protests culminated in bringing this matter before the Interstate Commerce Commission, which several times has taken evidence tending to show the hardships imposed upon lumbermen by reason of this custom. It is probable that the first lumberman who shipped lumber on an open car and had to provide stakes to keep it in, grumbled; later this dissatisfaction became general and as lumber movement increased, with the result above outlined. One of the most tangible results of the protests made was the voluntary allowance by a number of the southern roads of 500 pounds to cover the weight of the equipment, this to be deducted from the net weight, providing it did not reduce the revenue paying weight below the established minimum. Later the western roads agreed to put into effect a similar rule pending the determination of this question, or rather this latter was to be made until some suitable permanent form of equipment had

been devised. The western roads agreed to this method of settlement in September, 1906.

Joint Rates Canceled by Santa Fe.

If memory serves me faithfully, the Santa Fe railway at one time canceled all its joint rates on lumber with the Cotton Belt, and which action on its part caused a great deal of protest from lumbermen and resulted in the withdrawal of the cancellation order. Can you give me a brief history of this case?

A great deal of pine lumber is produced along the line of the Santa Fe in Texas and a great deal required along its line in the southwest. The traffic officials probably argued that inasmuch as production at least was equal to consumption, the output along on part of its road should supply the demand along other portions of its lines. In any event joint rates were canceled, and had this order not been repealed lumbermen would have had to depend upon the Santa Fe mills for their supply, because the sum of the locals on the Santa Fe, Cotton Belt and other roads would have been a great deal higher than the joint rates previously issued or the through rates from Santa Fe milling points to Santa Fe points of production. This phase of the matter was brought to the attention of the railroads by those whose interests were threatened and the outcome was a repeal of the order which had never been put into effect.

California Lumber Flumes.

Where and how are flumes operated?

In order to carry the sugar pine of the Sierras down to the mills located in the valleys of California flumes

are built, often traversing a distance of forty miles. The flume is a V-shaped trough built upon a sort of trestle work so constructed as to provide a fairly even incline down the mountain side. In this flume or trough there is a constant trickling stream of water. The first California flume was known as the Antelope. It proved a great success and was followed by others. The Antelope flume had a capacity of 80,000 feet a day. When the success of the Antelope had been demonstrated the Blue Ridge flume was built at a point a few miles north of Red Bluff and the Butte flume a few miles south of Red Bluff. These were each forty miles in length and had an aggregate capacity of 300,000 feet a day. They cost a total of \$1,000,000. In operating by flume all that is necessary is to put the log into the trough and let go.

At one time it was quite a fad with eastern people visiting California to ride down these flumes and the trip furnished considerable excitement. Once in a while an especially venturesome tenderfoot would essay riding one of the logs but he usually came to grief before getting out of sight of the camp. The ordinary method was to nail together a little V-shaped apology for a boat, tack a couple of cleats on it to hold to, get aboard and offer up a prayer for help. In some places the flumes dip down at a pretty sharp angle and when the explorer got well in motion down one of these he would be pretty apt to wish himself back in the east or wherever he came from. But when embarking down the Sierra Nevada flume there is only one way to stop and that is to keep going until you reach the end of the line. The only alternative is to fall off and even then one would be apt to travel quite a distance before finding a spot where he could rest.

State Railroad Commissions. Their Powers and Functions.

What states have railroad commissions or officers acting in the capacity of railroad commissioners and to what extent, if any, do they control freight rates?

The following compilation shows the states which exercise authority through commissioners and whether that authority extends to the making or approval of freight rates.

ALABAMA.

Commissioners, B. B. Comer, Birmingham, president; W. C. Tunstall, Greensboro; W. T. Sanders, Athens; Virgil C. Griffin, Montgomery, secretary.

The Alabama railroad commission is empowered to revise and alter freight rates and passenger rates of any or all railroads, such alterations to be binding within the Alabama state lines. If the roads affected do not change their schedules to meet the alterations made by the commission the latter has recourse to the courts.

ARKANSAS.

Commissioners, Joseph W. Phillips, chairman; J. E. Hampton and Frank Pace; W. E. Floyd, secretary, all of Little Rock.

The Arkansas commission has power to make freight, passenger and express rates within the state and has either made or approved of the rates in use by the carriers operating in Arkansas.

CALIFORNIA.

Commissioners, A. C. Irwin, Marysville, president; Adam Andrew, San Francisco; Orrin S. Henderson, Stockton; Judson C. Brusie, San Francisco, secretary.

The California Board of Railroad Commissioners has the power to make freight rates and to change existing rates from time to time as it may deem expedient. Any railroad company failing to conform to the rates approved by the commission shall by such default lay itself liable to a fine not exceeding \$20,000 for each offense. In all controversies, civil or criminal, the rates and fares established by the commission will be held as just and reasonable by all courts.

CANADA.

Commissioners, A. C. Killam, chief; Hon. M. E. Bernier, deputy chief; James Mills; A. D. Cartwright, secretary.

The railway commission of Canada apparently corresponds to the Interstate Commerce Commission of the United States, but is invested with greater power. The Canadian commission is authorized to pass upon all matters pertaining to railways and railway operations, including freight schedules and classifications. It acts in legislative and judicial capacities, being able to alter or create rates and classifications and to pass upon the legality of its own acts. It is not bound by decisions of other courts nor is it compelled to follow its own precedents, but acts with a free hand.

CONNECTICUT.

Commissioners, Andrew F. Gates, chairman, Hartford; W. O. Seymour, C. E. Ridgefield; O. R. Flyer, Torrington; Henry F. Billings, Hartford, clerk.

This commission has no jurisdiction whatever over either freight or passenger rates.

FLORIDA.

Commissioners, Jefferson B. Browne, Tallahassee, chairman; John L. Morgan, White Springs; J. Hudson Burr, Tallahassee; Royal C. Dunn, Tallahassee, secretary.

The Florida railroad commission has power to make local and joint rates covering freight and passenger traffic and to investigate existing rates and make suggestions for changes therein. In case such suggestions are not complied with the Florida commission is authorized to appeal to the Interstate Commerce Commission, whereupon the matter shall be tried by the latter body.

GEORGIA.

Commissioners, H. W. Hill, chairman; Joseph M. Brown and O. B. Stevens; George F. Montgomery, Atlanta, secretary.

The railroad commission of Georgia is authorized to make rates governing the railroads operating within the state. It is also empowered to prevent unjust discrimination against either persons or places.

ILLINOIS.

Commissioners, James S. Neville, Bloomington, chairman; Arthur L. French, Chapin; Isaac L. Ellwood, DeKalb; William Kilpatrick, Springfield, secretary.

The railroad and warehouse commission of Illinois has among its duties that of making a schedule of reasonable maximum rates for the transportation of passengers and freight. It publishes classifications compiled upon the basis of distance tariff.

INDIANA.

Commissioners, Union B. Hunt, chairman; William J. Wood and C. V. McAdams; Charles B. Reilley, secretary, and L. E. Morton, clerk, all of Indianapolis.

The commission has power to change, modify or substitute any existing rate in cases where a verified complaint has been made and the commission upon investigation has deemed such alteration or substitution necessary from the standpoint of equity. The commission has not the power to review rates generally, however, and cannot act except upon complaints as above outlined.

IOWA.

Commissioners, David P. Palmer, chairman; Edward A. Dawson and N. S. Ketchum; Dwight N. Lewis, secretary, and Thomas H. Boylan, clerk, Des Moines.

The Iowa commission has very full powers governing the railroads operating within the state. Under its jurisdiction come the management, conduct of business, treatment of the public and the fixing of maximum freight rates. The commission has compiled a freight schedule which practically is the fixed rates, in all cases being the maximum and in almost all cases the minimum charges.

KANSAS.

Commissioners, A. D. Walker, chairman; G. W. Wheatley and J. W. Robison; Cyrus Anderson, Topeka, secretary.

The Kansas railroad commission has general supervision of all common carriers, is empowered to revise freight rates and alter the same after having given written notice to the roads affected. If, thereafter, a

charge is made in excess of that declared as reasonable by the commission a refund of such excess may be secured by suit brought by the injured shipper.

KENTUCKY.

-C. C. McChord, chairman, Springfield; McD. Ferguson, Paducah, commissioner from the first district; A. T. Syler, Williamsburg, commissioner from the third district; M. R. Glenn, secretary, Frankfort.

The Kentucky railroad commission has the power to adjust differences between shippers and carriers and to fix rates. The commission has adopted a "distance tariff" which is based upon 100 pounds, with a sliding scale which increases the charge according to the distance the freight is carried. Thus for ten miles or less the charge per 100 pounds is 10 cents and for from 400 to 425 miles 78 cents per 100 pounds.

LOUISIANA.

Commissioners, C. L. deFuentes, New Orleans, chairman; Overton Cabe, Youngsville; W. L. Foster, Shreveport; W. M. Barrow, Baton Rouge, secretary.

The railroad commission of Louisiana is empowered to regulate joint through rates and charges for the transportation of freight between points within the state whether the shipments are made entirely by rail or partly by water. The commission also has power to alter existing rates, making such changes as it deems equitable. In Louisiana pipe lines are declared common carriers and placed under control and regulation of the railroad commission of Louisiana. The commission is further empowered to appear before the Interstate Commerce Commission whenever it believes that the interests of the shippers and consignees of Louisiana require such action.

MAINE.

Commissioners, Joseph B. Peaks, Dover, chairman; B. F. Chadbourne, Biddleford; Parker Spofford, Bucksport; E. C. Farrington, Augusta, clerk.

Freight and passenger rates of Maine railroads are subject to revision and alteration by the commission or by the state legislature. But before making such alterations the commission must give the company complained of an opportunity to set up its defense to the charge.

MASSACHUSETTS.

Commissioners, James F. Jackson, Fall River, chairman; George W. Bishop, Newtonville; Clinton White, Melrose; Charles E. Mann, secretary.

The board of railroad commissioners of Massachusetts has power to investigate and report only, its authority not extending to the altering or creating of rates. The board has power to pass upon and authorize or forbid the issuance of stock or bonds by any railroad company, but appears to have been created largely for the purpose of furnishing annual reports of conditions of railroads and street railways to the senate and house of representatives of the state.

MICHIGAN.

Commissioner, Theron W. Atwood; D. H. Clark, deputy commissioner; James Rice, mechanical engineer, Lansing.

The Michigan railroad commission has a very limited jurisdiction in regard to freight rates, its authority extending only to the prevention of discrimination by a road in favor of one shipper as against another.

MINNESOTA.

Commissioners, Ira B. Mills, Charles F. Staples and William E. Young; A. C. Clausen, secretary; Thomas Yapp, assistant secretary, St. Paul.

The Minnesota commission is given jurisdiction by legislative enactment over freight rates and classifications as well as the right to inspect the books of all the common carriers operating within the state. The railroads must publish all tariffs, rates and charges with rules and classifications, copies of which must be filed with the railroad commissioners. The commission has compiled a schedule of the terminal and the distributing merchandise rates which it has fixed as a reasonable maximum.

MISSISSIPPI.

Commissioners, S. D. McNair, president; R. L. Bradley and J. C. Kincannon; T. R. Maxwell, Jackson, secretary.

The Mississippi railroad commission has the power to revise and alter freight and passenger rates and in case its instructions in those regards are not complied with

by the carriers affected it has recourse to the state courts for the enforcement of the same.

MISSOURI.

Commissioners, Joseph P. Rice, chairman; John A. Knott and Frank A. Wightman; T. M. Bradley, secretary, Jefferson City.

The railroad and warehouse commission of Missouri has the power to fix rates, both freight and express, and does so on the basis of a distance tariff. The commission reports to the governor annually upon the work of the year, conditions of railroads, traffic etc. Its actions in regard to freight rates are binding except in event of reversal by the courts.

NEW HAMPSHIRE.

Commissioners, Henry M. Putney, Manchester, chairman; George E. Bales, Wilton; Arthur G. Whittemore, Dover, clerk.

The board of railroad commissioners of New Hampshire exercises authority over freight rates to the extent of changing existing rates upon it being made plain that they are unreasonable or discriminatory. If the directions or recommendations of the commission are not carried out by the railroads the former is authorized to present the facts to the attorney general of the state, who thereupon will take such action as may be necessary to force compliance with such directions or recommendations.

NEW YORK.

Commissioners, George W. Dunn, chairman; Frank M. Baker, Joseph M. Dickey, George W. Aldrich, Henry N. Rockwell; John S. Kennedy, secretary, Albany.

The New York board of railroad commissioners has only power to recommend changes in the freight schedules of intrastate roads. At special terms the state supreme court has power to pass upon such recommendations and compel compliance therewith by a mandamus. From this the railroads may appeal to the general court of appeals, which court may review and revise the finding upon the facts as well as the law.

NORTH CAROLINA.

Commissioners, Franklin McNeill, chairman; Sam L. Rogers and E. C. Beddingfield; H. C. Brown, clerk.

The North Carolina Corporation Commission, as it is termed, has supervision over railroads and railroad rates. It makes and revises both freight and passenger rates and has compiled a classified distance tariff which covers most of the roads operating within the state.

NORTH DAKOTA.

Commissioners, C. S. Vreisen, president, La Moure; E. A. Stafne, Galchupp; J. Christiansen, Towner; C. C. Hammond, Ashley, secretary.

The North Dakota railroad commission has the power to fix freight rates within the state boundaries, but as yet has not exercised its authority to any great extent.

OHIO.

Commissioners, J. C. Morris, chairman; O. H. Hughes and O. P. Gothlin; H. D. Mannington, secretary, Columbus.

The seventy-seventh general assembly of Ohio passed a bill April 2, 1906, which became a law April 16, creating a railroad commission for the state of Ohio. The preamble to the act was that it was "an act to regulate railroads and other common carriers in this state, create a board of railroad commissioners, prevent the imposition of unreasonable rates, prevent unjust discriminations and insure an adequate railway service." The commission was given power to adopt and publish rules to govern its proceedings and to regulate the mode and manner of investigations and hearings of railroads. The commission was also given power to enforce reasonable regulations by furnishing cars to shippers and for the switching and weighing thereof. The commission has the power to investigate complaints of shippers against alleged excessive or discriminatory rates and if it finds the complaints to be just to alter such rates, following which action the railroad companies are bound to change their schedules in accordance with such changes.

PENNSYLVANIA.

The Pennsylvania department of internal affairs, Harrisburg, of which Isaac S. Brown is secretary, has a bureau of railways which is the Keystone state's substitute for a railway commission. This bureau has no power to make or alter rates. It reports upon trans-

portation questions and problems to the governor each year in a voluminous compilation covering besides the railroads, canals, telegraph and telephone companies.

RHODE ISLAND.

Commissioner, E. L. Freeman, Providence; J. W. Freeman, Central Falls, deputy.

The Rhode Island Railroad Commission has no power or authority in relation to freight rates except for the transportation of milk, and then only in case of discrimination.

NORTH CAROLINA.

Commissioners, J. H. Wharton, chairman; B. L. Caughman and J. H. Earle; D. P. Duncan, secretary.

The South Carolina railroad commission is authorized to make all local rates of railroads operated within the state. The service of these rates upon the railroads affected is prima facie evidence that they are just and reasonable, and they are binding upon the roads unless reversed by the courts.

SOUTH DAKOTA.

Commissioners, F. LeCocq, jr., Harrison, chairman; D. H. Smith, Miller; W. G. Smith, Sturgis; W. H. Stanley, Sioux Falls, secretary.

The board of railroad commissioners for South Dakota is a body which is not invested with the power to make or alter freight rates or classifications. Its jurisdiction is limited to examining the business and operations of the various intrastate lines and reporting to the governor of the state. The commission acts the part of a mediator between complainants and the railroads and endeavors to adjust their differences.

TENNESSEE.

Commissioners, J. N. McKenzie, chairman; Thomas L. Williams and B. A. Enloe; Frank Avent, secretary, Nashville.

The Tennessee railroad commission exercises jurisdiction over local freight rates whenever and wherever it considers the rates unreasonable.

TEXAS.

Commissioners, L. J. Storey, chairman; Allison Mayfield and O. B. Colquitt; E. R. McLain, secretary.

The railroad commission of Texas has jurisdiction over all passenger and freight rates in intrastate business. The commission has promulgated a Texas classification of freight.

VERMONT.

Commissioners, F. C. Smith, St. Albans, chairman; George T. Howard, Craftsbury, clerk, and H. S. Bingham, Bennington.

The Vermont Board of Railroad Commissioners has no general power for the regulation of freight rates and has no authority to make rates of any description.

VIRGINIA.

Commissioners, Beverley T. Crump, chairman; Henry C. Stuart and Joseph E. Willard, Richmond.

The Virginia railroad commission is known as the State Corporation Commission. It was created by the state constitution which went into effect in July, 1902. The commission was endowed with all the legislative power in the matter of prescribing rates and making regulations for the general control of transportation and transmission companies which was possessed by the state. In addition to the above authority the commission also has judicial functions, being enabled to pass upon the legal status of the rates it makes or alters, thus avoiding the delay which has characterized the attempted enforcement of rates made by the commissions of other states. Probably the Virginia commission has greater power than any other state railroad commission. Acting in its judicial capacity the Virginia State Corporation Commission is required, before putting a proposed rate into effect, to give notice by a process equivalent to the writ of a court which summonses the railroads interested to a hearing as to the propriety, validity and reasonableness of the proposed rate. At the hearing the committee sits as a court; the record of its findings is a judgment of court and is binding upon all other courts of the state. To be set aside an action must be taken to the court of appeals. Thus having established the legality of the proposed rate the commission, then acting in its legislative capacity, proceeds to enforce it.

WASHINGTON.

Commissioners, H. A. Fairchild, Bellingham, chair-

man; John S. McMillin, Seattle; John C. Lawrence, Olympia.

The railroad commission of Washington exercises jurisdiction over freight rates, demurrage and reciprocal demurrage. The service upon the road affected of a notice containing the alterations in its freight schedule which have been made by the commission makes the same operative. If the railroad believes the amended rates to be in violation of law or unreasonably low it may appeal to a superior court.

WISCONSIN.

Commissioners, John Barnes, chairman; B. H. Meyer and Halford Erickson; J. N. Winterbotham, secretary, Madison.

The railroad commission of Wisconsin has power to hear and decide complaints upon classification, exorbitant rates and all other matters which arise between the shippers and railroads of Wisconsin. Where it is impossible for the commission, the railroads and the complainants to agree formal hearings are had and decisions are rendered as is done in ordinary courts of law, the decision being appealable to the state courts.

PART XIV.—MISCELLANY.

MANUFACTURES OF WOOD.

Manufacture of Spools.

Are there any mills exclusively devoted to the manufacture of spools?

Several mills are said to be engaged in the manufacture of spools from white birch, trees being cut that range from five to eight inches in diameter. The timber is bolted into three or four foot lengths, then slabbed and ripped to dimensions suitable for the purposes intended. These mills, it is understood, make other articles besides spools, such as hook and pin racks, chopping bowls, pastry boards, and other small wooden articles.

How Toothpicks Are Made.

How are toothpicks manufactured?

The logs from which toothpicks are made are cut up into 28-inch bolts. These bolts are then thoroughly steamed and cut into veneer. The veneer is cut into long ribbons, the width of these ribbons being the desired length of the pick. The wooden ribbons are then run through the toothpick machinery eight or ten at a time and fall into two hoppers, the perfect toothpicks in one and the broken bits into the other. The toothpicks are then packed by girls into

boxes containing 1,500 each, and these small boxes are then put into cases and are ready for shipment.

Who Made the First Barrel.

Who made the first barrel?

The earliest record is that of the Roman author Pliny, who attributed the invention to the Gauls. However, it seems that the French were not the inventors of cooperage, for an early inscription copied from an Egyptian monument shows a man emptying grain from a wooden vessel made with hoops. This measure is barrel shaped and apparently the prototype of the modern Egyptian kayl.

Value of Vehicle Industry Products.

What is the total annual value of the road vehicle products of the United States, and what amount of lumber goes into each year's production?

According to the census of 1900 the total value of the products of the vehicle industry was \$121,537,276 for that year. This included automobiles, public conveyances, carriages of all kinds, sleighs, sleds and all other vehicles, covering both their first cost and their repair for the period mentioned. It is estimated that 257,031,542 feet of lumber was used in their construction, the value of which was \$8,940,820.

Nail Keg Manufacture.

We are considering the advisability of putting in a stave mill for making nail keg staves. About what is the price on these staves? Do the nail manufacturers, as a rule, manufacture their own staves?

Nail keg staves are reported to be worth about \$3 for good chestnut or elm stock. Birch staves bring

(1905) \$2.75 a thousand; heading \$18 a thousand sets. Undoubtedly some nail manufacturers have facilities for making their own staves, but with this information it should be easy to determine whether they can be manufactured at a profit.

Inception of Packing Box Industry.

What was the beginning of the packing box business and what event furnished the greatest impetus in the upbuilding of the industry?

In 1827 Jackson Bros. engaged in the making of boxes for the soap and candle trade on Boston Neck. About the same time a Mr. Tirrell began making large packing cases called "pulpits." These were used by the well known coast factories.

In 1850 the rush of prospectors to the California gold field compelled vast shipments of all classes of goods to that newly opened territory and the packing box industry enjoyed a tremendous expansion. Since then the making of boxes and wooden packages generally has branched out in all directions following the multiplication of manufacture.

PULPWOOD.

Pulpwood Required for Ton of Paper.

How much pulpwood is required to make a ton of paper?

A cord of wood averages 1,200 pounds of pulp, and it takes about five tons of wood pulp to make three tons of paper, which means that approximately two and seven-ninths cords of wood, or 3,334 pounds, will produce a ton of paper.

Woods for Pulpwood.

What woods are used in the manufacture of pulpwood?

Spruce has always been the favorite for the manufacture of pulp, but its growing scarcity has compelled manufacturers to make substitutions and considerable hemlock and popular, low grade pine and white fir now are used. Pulp may be manufactured from almost any wood, but those mentioned seem the best adapted for that purpose. A thousand feet of lumber will make from two and a half to three cords of pulpwood.

Bisulphite Process for Pulpwood.

What is the bisulphite process of making pulpwood?

The difference between this process and the ordinary grinding of the wood is that in the former the chips are placed in a machine called a digester and reduced to the required condition by the action of a chemical combination of soda ash and lime. The advantage of this system over the ordinary grinding process is that the wood fiber remains intact, which paper manufacturers claim makes it better adapted to their use and results in a superior quality of paper.

RAILROAD TIES.**Annual Consumption of Ties.**

What is the annual consumption of railroad ties?

Figures on this point are necessarily approximate only. The total railroad mileage of the United States at the beginning of 1906 was about 220,000. Railroad men state that about 400 new ties are required annually for renewals for each mile of track to keep it in good condition. Upon this basis there would

be an annual consumption of 88,000,000 ties, but inasmuch as the railroad mileage of this country is increasing at an average of 6,000 miles a year, and will average 3,500 ties to the mile, there would have to be added to this total 21,000,000. To this should be added something for elevated, interurban and street car lines, making an approximate total of 120,000,000 ties a year. Allowing thirty-five feet of lumber to a tie, this means 4,200,000,000 feet. This estimate is not in keeping with the report compiled by the Forest Service, which credits the railroads with having purchased only 77,981,227 ties in 1905, which on a basis of thirty-five feet to the tie, represents a total of about 2,730,000,000 feet, board measure.

Are Railroad Ties Lumber?

Will you kindly inform us if, in your judgment, cross ties, either hewn or sawed, can be properly graded as lumber?

If, by "graded" the correspondent means "inspected," the answer would be positively "No," for ties are graded according to the specifications furnished by the railroad companies that are to use them; though there are what might be called standard specifications in use by a good many of the roads, especially those which use sawed yellow pine ties. But this inspection is entirely different from lumber inspection.

If the inquirer means to ask if cross ties may properly be "called" lumber, we will have to reply that custom varies in different sections. No hewn ties are classed as lumber, but sawed ties sometimes are. Ordinary track ties, say 6x8-8, sawed out of yellow pine, are called "ties" as a general thing west of the Mississippi river, but are called "lumber" east of the river. That is to say, west of the river, as a rule,

mills reporting on their output will report so many feet of lumber and so many ties. East of the river, however, the ties would be classed with the lumber, and, to a certain extent, mills in Mississippi and other states in the southeast would speak of so many thousand feet of lumber in the shape of ties, giving the dimensions. Ties longer than standard, however, such as switch and bridge ties, all over the south are called lumber if sawed. In the north sawed ties are usually considered simply as ties. Most railroads in making up their freight tariffs give ties a special classification, but this is not always the case, some classifying sawed ties as lumber. The custom does not seem to be general enough nor well enough defined to warrant making a specific answer.

Number of Ties Used in One Mile of Road.

How many ties are used in a mile of railroad construction?

There is no absolutely uniform rule in regard to the number of ties used, and in some cases ties below standard grade are used and extra ties put in to make up the difference. Probably 3,500 ties to the mile would be a fair average on one of the big standard roads. The average on the Frisco line is 3,200, the Arkansas division running 3,280. Some lines run as high as 4,000 ties to the mile.

Most Durable Tie Timber.

What is the longest lived tie timber?

Several years ago the Pennsylvania railroad system experimented in the use of ties made from Morawood, grown in British Guiana. The claim is made for these ties that they will last fifty years, but the

life of the tie has not been tested in this country, as those placed in position by the Pennsylvania railroad have been down only about four years. They cost, delivered, about \$1.50 each, as against the delivered price of 75 cents (1906) paid for white oak ties, which it is understood is the wood principally used by the Pennsylvania system. White oak will last from ten to fifteen years, according to conditions, soil and climate.

Substitute for Wooden Ties.

Has any practical substitute for wooden ties been devised?

The problem of a practical, efficient substitute for wooden ties has occupied the attention of railroad engineers for years. Many varieties of steel and concrete and combination ties have been tried and found wanting. Owing to the constant lessening of the supply of timber experiments have increased along this line. What is claimed to be a successful solution of the difficulty is the invention of G. H. Kimball, chief engineer of the Chicago & Alton railway. It is a combination of concrete, steel and hardwood. The concrete part consists of two blocks 7x9 inches, three feet long, one of which is placed under each rail in such a manner that the center of pressure and center of figure (center of area) of each section will correspond. These blocks are connected by two 3-inch steel channels which are molded into them, thus making a rigid tie. A hardwood block 3 inches thick, 9 inches wide and 18 inches long, designed to cushion shocks, distribute pressure, support derailed trucks and serve as a spiking block, is secured to the top of each concrete block by an iron bolt which is fastened into a cast iron socket, the latter being molded

into the concrete block. It is claimed for this tie that it has greater permanence than any other and it is said to have been in use on the Chicago & Alton and Pere Marquette railroads for several years and to have proven entirely satisfactory.

SHIPS AND SHIPPING.

Rules for Loading Vessels.

What are the rules for loading a vessel which has been chartered to carry lumber?

It is customary for the owners of the vessel to fix upon a minimum for the amount of lumber which can be loaded into the vessel each day (Sundays and holidays excepted) until the expiration of the laydays and to exact demurrage for the number of days the vessel was held in port beyond the number necessary to load her at the rate given. Thus, if 35,000 feet were the daily loading minimum for a vessel carrying 350,000 feet and she were detained in port twelve working days the shipper would be compelled to pay two days demurrage, probably about \$75, for a vessel of the size mentioned.

Lumber Capacity of Vessels.

Is there any rule for figuring the number of feet a vessel will carry?

There is a rule which is applied to rough yellow pine shipments, but it is simply approximate and affords nothing better than a fairly accurate guess at the probable carrying capacity of the vessel. The amount is arrived at by multiplying the tonnage by 873, which will give the number of feet of lumber an

ordinary vessel should carry.' This average was obtained by dividing the cargoes of a number of vessels by their respective tonnages, adding the results together and dividing by the number of vessels considered. But as some vessels will carry 1,200 feet to the ton and others not more than 500 it will be seen that the above rule is subject to a considerable variation. It depends entirely upon the shape and general build of the vessel and the character of the lumber.

Records of Loading Vessels.

Does it pay to keep a record of each day's work in the loading of a vessel?

It certainly does. In fact, a record should be kept of the movements of a vessel from the time it reaches the port at which lumber is to be loaded until it sails. The amount loaded each day should be put down, as well as any hinderances which may arise. The charter party in speaking of loading, mentions the fact that an allowance be made for unfavorable weather, consequently, in case of rain or other atmospheric disturbances which render it impracticable to load, it is well to have that fact recorded, because in the event that demurrage becomes due the allowance or nonallowance for this unfavorable weather might come up and if the shipper had nothing beyond his memory upon which to base his claim, he might have some difficulty in convincing the captain that there should be no demurrage charge for that particular time. Also, in case of trouble with the stevedores—usually hired by the captain—it is well to be able to prove that any consequent delay in loading the vessel was beyond the control of the shipper.

Liability for Damages to Lumber on Shipboard.

In cargo shipments are owners of the vessel liable for damages if the stock is not received in good condition?

The master of the vessel is obliged to sign bills of lading which read, "received in good order and condition," and if, when the vessel arrives in port the stock is not in "good order and condition" the owners of the vessel are liable for damages. The principal cause of injury to cargo shipments is carelessness of stevedores in piling boards of unusual thicknesses together. This works havoc with the under boards in increasing proportion as the pile grows and the weight upon the lower boards increases.

LUMBER LORE.

North American Woodlands.

What are the total areas and wooded areas of the political divisions of the North American continent?

DIVISIONS—	<i>Total area, square miles.</i>	<i>Wooded area, square miles.</i>
British America	3,795,308	1,725,000
United States (with Alaska).....	3,572,040	1,140,000
Mexico	767,000	150,000
Central America	163,465	100,000
South America	7,685,000	6,000,000
Totals	15,982,813	9,115,000

How to Specify Sizes of Piling Desired.

In ordering the piling should the diameters of the tops and butts be specifically stated?

The tops should be given and there should be an allowance for these. If the buyer can use piles eight inches in diameter at the top the order should read from eight to ten inches and the diameter of the butt

may or may not be given. It would be impossible for any lumberman to fill an order which called for piles of a certain diameter at the top and another fixed diameter at the butt for the very simple reason that no two trees grow exactly alike and where one might taper to conform with the required specifications others would not. The proper way to order is as above stated. As a rule it is possible to come pretty close to the diameter which is wanted for the top, but on an order for 50-foot piling the top is quite a way from the base of operations and it would hardly pay for a lumberman to cut a tree down and then discard it from his calculations because the top did not quite conform to the order, or to climb up fifty feet and measure the top before cutting.

New York's Timber Area.

What is the timbered area of New York?

Practically all the timber covered territory in New York is in the Adirondack region, which comprises, roughly speaking, 6,000 square miles, or about 4,000,000 acres. Of this area the state owns about 800,000 acres, which is absolutely withdrawn from sale. Approximately 500,000 acres are controlled by clubs or individuals, and have been turned into private parks. Spruce is the prevailing softwood.

Largest Yellow Pine Forest.

In what state is the largest yellow pine forest?

One of the largest is credited to Mississippi. Twenty-five counties along the Illinois Central railroad, south of the Alabama & Vicksburg, are said to contain 5,860,000 acres of fine timber averaging 6,000 feet to the acre, or a total of 35,160,000,000 feet.

Largest Forest in the World.

Where is the largest forest in the world?

In the Ungava (formerly known as Labrador) and Hudson bay district, Canada, is a forest which is roughly estimated to be 1,700 miles long and 1,000 miles wide, which probably is the largest forested area in the world.

Hemlock Bark, Winter and Summer Peel.

Is there any difference in the value of hemlock bark peeled from hemlock logs cut in the winter and the bark taken from logs cut in the summer?

A difference of opinion exists regarding this matter, but it seems pretty generally to be accepted that mill log bark (bark from winter cut logs) is fully equal to the bark peeled from logs cut during the summer and fall months.

Natural Increase of Timber.

Do forests increase in the amount of merchantable timber they contain—that is to say, if a man should buy a tract of virgin timber today and let it remain untouched for twenty years, would there at the end of that period be a greater stand than there was at the date of the purchase?

Under certain conditions yes, but under ordinary circumstances there would not. Nature destroys as rapidly as she produces and in the ordinary forest growth there is a decrease, caused by trees dying, being blown down or, having ceased to grow, checking the growth of young trees around them. The total decrease is equal to the increase caused by increment in the younger growth. The only material increase which would occur in a forested area would be in one which had been swept by a tornado and the old trees destroyed, leaving light and room for the

growth of the younger trees, or in the case of a tract which has been swept by fire and a part of the growth destroyed, or where a majority of the trees were young. In a matured forest, however, there is practically no increase.

Chinese Lumbermen in the United States.

Are there any Chinese lumbermen in this country?

The first floor of a four-story tenement house on Mott street, New York city, is occupied by Chinese retail lumbermen who sell to their countrymen and other foreigners of the district. Their sales are said to run from \$50 to \$100 a day. These Orientals could give some American retailers points on how to run a cash business. Their sales are almost all small dribblets, but if the sales are small the profits are large. The Chinese lumber buyer is said to thoroughly understand his business, but he does not rely wholly upon his individual knowledge. On an order for material for a wash tub the intending purchaser insists that the consignment be submitted to a rigid inspection not only by himself but by at least a dozen of his neighbors.

Of course there are a number of Chinese working among the western mills, but the Mott street institution is the only one in this country run by Chinese, so far as known.

First Lumber Yard at Toledo, Ohio.

Who established the first regular lumber yard at Toledo, Ohio?

For several years prior to 1845 a Captain Crane had a small yard at the corner of Summit and Adams streets. The stock consisted largely of woods of local

production, supplemented by an occasional cargo of pine lumber and shingles from some point on Lake Erie. The demand was small and trade did not justify him in carrying a large stock.

The first yard of importance was established after the completion of the Miami extension canal in 1845, by Joel Kelsey. This canal opened communications between Cincinnati, Toledo and the Miami valley. Kelsey arrived in Toledo in July, 1845, with a canal boat load of lumber, which was unloaded and the vessel dispatched for another cargo. The lumber was divided into two grades, clear and common, which were sold for \$8 and \$16 respectively. The overturn the first year was about 200,000 feet, the large business being due to a dry season, which shut off the supply from Pennsylvania.

White Ant Pest.

During a recent discussion of the possible demand for lumber in the construction of the Panama canal a friend mentioned the white ant pest, which is said to materially affect the life of all lumber used in the countries where the ant is found. I wish you would kindly enlighten me on this matter and state in what localities the white ant is encountered and in what manner it affects the lumber in the countries where it is found.

The white ant, which is known as the boring ant or termite, is found in nearly all tropical countries. The seriousness of their work varies greatly. In the Philippines, for instance, the life of many woods is quartered by the ravages of these pests. By some lumbermen they have been termed land teredos and they destroy the wood in much the same manner that the marine pests do; that is, they work from the inside and hollow out the lumber. There are several woods found in the Philippine islands which are impervious to these

insects, and the redwood has been found upon being tested to contain some substance which does not tickle the palate of these persistent agents of destruction.

The redwood of California is about the only kind of lumber found in this country that in an untreated condition will not be harmed by the white ant and the manufacturers anticipate a considerable business with Panama while the canal is being dug. The white ant does not stop with the ordinary building material and apparently makes no discrimination between that used for the footboard and that used in making furniture. He works on the inside, so that it is never possible to find out what he has accomplished until a piece of lumber has been split open.

This is one of the difficulties to be encountered which seemingly has been given very little attention, but which undoubtedly will force itself upon the notice of those who have the work of construction in charge. As to what extent the insect will interfere with the work it is, of course, impossible to say.

Lack of Definiteness in Placing Orders.

We inquired of a manufacturer regarding terms on red birch moldings and received a reply offering 55 percent off. Later we ordered a job of red birch finish. It came and we admit that it was a desirable stock, but in the bill rendered. Instead of giving us the discount quoted, he charged us nearly double, claiming that the stock had all been selected. We did not order it selected, and in fact knew that we would get unselected stock and that his discount was for unselected stock. In spite of this he maintains we should pay him for the selected stock, claiming that by using the term red birch we meant that it should all be of a color, whereas we ordered it red birch to distinguish it from black birch, the same as we would order red oak to distinguish it from white oak.

This is only a small matter, but he is attempting to hold us to his charge and we would like to have your views on the controversy.

In very few cases where disputes arise between buyer and seller are the circumstances surrounding the case exactly similar. This condition of affairs was recognized by the wag who intimated that the only opinion worth the paper on which it was written was that of a court of competent jurisdiction. It is difficult to judge the merits of a contention of this character without being acquainted with the details leading up thereto. The wording on the price list designating the stock ordered would have something to do with the reasonableness of the position taken by either party. If the goods ordered were listed as red birch molding and so specified in the order it is difficult to see where the seller would have reason for increasing the price because he selected the stock. On the contrary, if stock goods were quoted in the list and a special bill ordered the manufacturer naturally would charge more for the special work than for the ordinary molding carried in stock.

The manufacturer is not entirely guiltless in such matters. It should be his province to understand what is desired and the price which the buyer expects to pay, and if the quality of material ordered cannot be supplied at prices quoted then it becomes obligatory on his part to notify the purchaser that an additional charge will have to be made. In the rush of modern business affairs it is not always convenient or possible to do this, which renders it more and more imperative that orders be plainly worded so that they may be clearly understood, and their provisions executed as outlined.

Louisiana Swamp Lands.

Was the Louisiana swamp land or overflow land which was given to the state by the government disposed of under the McEnery scrip?

Answer to the inquiry involves the recital of a little history. When the United States purchased the Louisiana territory it secured title to practically all of the land, the exceptions that grants made by France, the former sovereign power, were recognized. From time to time congress by special acts donated the state certain lands for some specified purpose. Later the swamp land act, so called, was passed, which briefly provided that all lands, 51 percent of which were subject to periodical inundation, should become state property. Louisiana claimed never to have been given all the land that should have been given it under this act, and in 1880 the state legislature passed act No. 23, authorizing the governor to employ counsel to assert the rights of the state to lands donated by the federal government or to recover the value of such lands in money or scrip. It was claimed that some of the lands had been illegally disposed of by the federal government and that other portions though listed to the state had been improperly suspended or rejected by the federal government and approval to the state refused. The contract made between Governor Wilz and S. D. McEnery related only to those lands claimed by Louisiana and which the general government refused to grant.

It is a very easy matter to ascertain whether or not any particular tract of land will be affected by the outcome of the fight now being made on McEnery's scrip. The records show the manner in which the land was acquired, whether it was located by scrip issued to McEnery or bought outright from the state.

In addition to the trouble over this scrip, some question has been raised in regard to the classification of certain other lands. It is not a very easy matter to determine the facts in regard to the latter, which so far has not received a great deal of attention. Titles to land which were purchased from the state are not affected in any way by the trouble over the McEney scrip. In regard to this matter it may be said that the government and others now recognize the injustice of depriving property holders of their rights to land which have not been questioned for nearly a quarter of a century. In many cases the present owners who are innocent holders have paid taxes on their lands for years, have lived on them and improved them and in this way added to the wealth, dignity and population of the state. They have a right to their property which it is hardly possible any court will set aside on a technicality.

Mill Run in Hemlock.

What is the dividing line between log run and mill culls in the hemlock trade as a general practice?

In Wisconsin the dividing line between log run and mill culls is No. 3, all below being classified as mill culls; all above that, part of the log run. In Michigan there is said to be some difference in the practice, but the result is about the same, and the same probably will apply to Pennsylvania.

Modesty of Shoppenagons.

Who is Shoppenagons and where does he live?

He is a conspicuous figure at the Michigan Retail Lumber Dealers' Association meetings. He is a venerable Indian who resides at Grayling and is identi-

fied with the antique départment of the business of Salling, Hanson & Co. His granddaughter, Nancy Shoppenagons, a dusky Indian princess, is a picturesque figure.



SHOPPENAGONS.

One thing that attracts attention and the admiration is "Shopp's" modest denial that he at present is an Indian chief. He is the last of his tribe in that section and was formerly a chief in Canada. But Shopp has wisely decided that a man can not be a chief when he has no tribe over which to preside.

"Me no big chief, me," he is wont to say. "Me just man, me."

There is a suspicion that Shopp abandoned his pre-

tensions as an Indian chief several years ago when he mixed with a bunch of Indians at Detroit, who went a pace which even Shopp, trained as he was to the hot and dusty trail, could not hope to maintain. This occasion was the gathering of another great tribe of Indians whom Shopp mistook for Sioux but was informed belonged to a new tribe known as Hoo-Hoo.

Pine Bark Beetles.

What is the pine bark beetle?

The pine bark beetle, otherwise known as the *Dendroctonus ponderosae*, is a native of the Black Hills forest reserve. It is a deadly enemy to certain species of pine trees, especially to the bull pine of the Black Hills forests. The beetle enters the bark of the tree in August or September. It does not work on the wood cells but upon their contents. The effect of its operations is soon noticeable, the tree beginning to show a bluish tinge which starts at the point of attack, gradually covers the entire surface and in time kills the tree.

To Guard Against Fire.

What precautions may be taken in the office and yard to prevent fire.

Defective heating apparatus is the cause of many fires, and it is important to observe the following recommendations before putting heating apparatus into regular service:

First—Furnish metal mats for stoves.

Second—Where stoves are located near woodwork, protect woodwork by metal.

Third—See that metal collars, affording suitable

air spaces, are provided where stove pipes pass through woodwork.

Fourth—Provide metal receptacles for ashes.

Fifth—Do not pump ashes in any place where there would be danger of a hot coal coming into contact with combustible material.

Sixth—Where terra-cotta flues are in use discard them, using brick instead.

Seventh—Remember that defective flues are frequent causes of fires.

Eighth—See that steam pipes do not come into contact with woodwork and that all rubbish is kept away from them.

“Sulphur Storms” Caused by Pollen.

What is the cause of the “sulphur storms” in the south?

In the spring southern pine trees bear a pollen which is often carried quite a distance when there is a strong wind. It is sucked up into the air and comes down with the rain looking anti smelling very much like sulphur. It is unusual for these pollen showers to occur, but they sometimes do and have been the occasion of a number of conversions among the colored population, who, not knowing their origin, took them to be forerunners of the wrath to come.

Chronological History of House of Hoo-Hoo.

Will you kindly give me a history of the House of Hoo-Hoo?

Here it is in chronological order:

February 11, 1902—Suggestion for a lumbermen's club at the Louisiana Purchase Exposition made at New Orleans.

March 28, 1902—Board of governors of the lumbermen's club effected an organization at St. Louis.

April 24, 1902—Name “House of Hoo-Hoo” adopted and incorporation authorized.

July 22, 1902—Building space for House of Hoo-Hoo granted by the Louisiana Purchase Exposition authorities.

September 10, 1902—House of Hoo-Hoo project formally indorsed by the Concatenated Order of Hoo-Hoo in annual session at Milwaukee by resolution offered by J. E. Defebaugh.

October 1, 1902—Governor Francis presented building site in exposition grounds to board of governors of House of Hoo-Hoo.

November 25, 1903—Contract for erection of the House of Hoo-Hoo signed.

December 9, 1903—"House of Hoo-Hoo Day" the occasion of a vigorous membership campaign throughout the country.

April 29, 1904—House of Hoo-Hoo finally completed.

April 30, 1904—House of Hoo-Hoo dedicated with formal ceremonies.

May 16, 1904—Dinner by L. J. Wortham, Texas World's Fair Commissioner, to Woman's Press Association, in House of Hoo-Hoo.

May 24, 1904—Monthly meeting of the Yellow Piners at the House of Hoo-Hoo.

May 24-25-26, 1904—Second annual convention of the National Lumber Manufacturers' Association at the House of Hoo-Hoo.

June 11, 1904—Hoo-Hoo concatenation at House of Hoo-Hoo, with twenty-one candidates.

June 14-15-16, 1904—Semiannual convention of the Southern Lumber Manufacturers' Association at the House of Hoo-Hoo.

June 20-21-22-23-24, 1904—House of Hoo-Hoo headquarters of the American Institute of Architects.

June 24, 1904—House of Hoo-Hoo entirely destroyed by fire.

June 24, 1904—Re-erection of the House of Hoo-Hoo ordered.

June 27, 1904—Contract let for reconstruction of House of Hoo-Hoo.

June 28, 1904—Rebuilding of House of Hoo-Hoo begun.

July 23, 1904—New house completed and dedicated.

After the fair closed the building was sold and dismantled and shipped to Havana, where it now serves as one of the higher class cafes.

Does It Pay to Peel Piling?

In ordering piling does it pay to have the piles peeled?

The buyer may have a number of reasons for wishing the bark removed from the piles, but one consideration which is sure to be active is the saving of freight. From April to September, when the sap is rising it is a very easy matter to peel the bark off. It can be done with a spade at an expense of from 5 to 15 cents. In the fall and winter months the sap has changed to a sort of glue which holds the bark firmly to the tree and the peeling will have to be done with a drawing knife at an expense of 20 to 30 cents a pile. While at first glance it might seem that saving the freight on bark would not be important, a little mathematical calculation proves that it would make quite a difference in the bill. Take an order for 1,000 piles, eight inches at the small end and twelve at the butt, fifty feet long. The bark would average three-eighths of an inch thick and would have an average width, if peeled off in one strip, of $31\frac{1}{2}$ inches. Multiplying $31\frac{1}{2}$ by $\frac{3}{8}$ of an inch by 50 feet would make practically fifty feet of bark, board measure, a pile. This on 1,000 piles would be 50,000 feet; and at a freight rate of \$6 a thousand feet would mean a saving of \$300. Besides this it would be possible to load more piles on the car.

How to Dress Hemlock.

What is the best way to dress hemlock?

Owing to the peculiar character of hemlock lumber it will dress better green than dry. The planer knives do not pull the knots out of the green wood and it can be dressed smooth and will dry flat grain. A

great percentage of the hemlock of Pennsylvania is dressed when green.

Lumber Industry of India.

What is the status of the lumber business in India?

There is reputed to be 118,000 square miles of forest in India, of which between 30,000 and 40,000 square miles are being worked under the plans of the Indian forest department. The rules of the department stipulate the manner in which the trees shall be felled and also for the removal of the minor products, such as large grasses; various exudations, such as rubber, gamboge, gutta-percha, resins, gums, some of which are extremely valuable, and a miscellaneous assortment of other matters including some of the material for the manufacture of the famous Indian dyes. Some of the forests are covered by old grazing rights and these must be considered by the operator. Forest fires are a thing to be guarded against, which entails considerable expense, which is in the main borne by the forestry department.

The principal export wood is the teak, which is shipped in timber mostly from Burma. Blackwood is exported to a certain extent and comes chiefly from the Malabar coast. One of the recent woods to find its way into favor in the European and American furniture market is the padauk, which is an exceptionally fine furniture wood. There are, of course, small quantities of satinwood, ebony, sandalwood, rattan, choice bamboo and red sandalwood, for dyeing, shipped to foreign countries each year, but the trade in these woods is not very heavy.

There has been some effort made to manufacture other woods and introduce them into foreign markets,

but the difficulties encountered in securing them and the high cost have made this unprofitable. J. S. Gamble, C. I. E., in a recent paper on the forests of India, places the sal, sisso, khair and babul in the list of gregarious trees, but the majority of these lie at too great a distance from the coast to admit profitable handling. The pyengado of Burma, while growing in profusion, is not of especial value except for rough construction purposes, it being especially adaptable for sleepers, telegraph poles and similar uses. It is said to be the best wood for sleepers (ties) in the world.

The forests of India are all under the supervision of the forestry department and are zealously guarded.

Lumber Industry of Isle of Pines and Cuba.

What information, if any, can be secured relative to the lumber industry in the Isle of Pines and Cuba?

The Isle of Pines is relatively unimportant as a factor in the lumber industry, both production and consumption being insignificant. It has been estimated that Cuba has 500,000 acres of virgin forests, consisting principally of mahogany, cedar and other valuable tropical hardwoods. The bulk of the common lumber used in Cuba is supplied by mills along the Gulf coast of the United States. In 1905 these mills shipped about 125,000,000 feet to the island, about half of which was used in Havana. The trade has been good in Cuba for several years. After the close of the Spanish war the development of the timber resources was begun on a large scale with the result that the markets of the world which use Cuban mahogany and cedar became glutted with this stock. The demand lightened and resulted in stock accumulating in the hands of the producers, who in turn

curtailed their operations. Consequently, the surplus disappeared and the market worked its own cure.

Clapboards Defined.

What are clapboards?

Clapboards are a product of the eastern mills which are identical with the bevel siding of the west but manufactured in a different way.

Selling Lumber by Samples.

Has anyone ever tried selling lumber by samples, that is, having a downtown office in a good location with stock samples and the yard outside somewhere where property is cheaper?

This system has been tried in several places and opinions differ as to its successful working. The majority of lumbermen incline to the belief that consumers like to go out into the yard and see the lumber for themselves, have the pile pulled to pieces and get the bottom boards, in the belief that they are hidden away because of their superior quality.

Oldest Lumber Concern in United States.

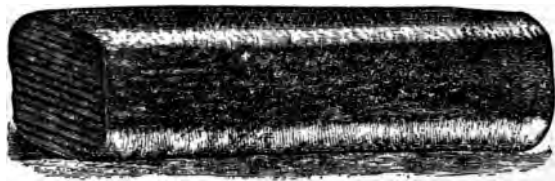
What is the oldest lumber concern in the United States?

In 1798 Hugh McIlvain established a lumber yard at the junction of Market street and the old Lancaster road, West Philadelphia, Pa. The business has continued uninterrupted to this year (1906), the only change made in the concern being that in 1867 the name was changed to J. Gibson McIlvain & Son, by which it is still known. The concern has operated continuously 108 years, and this is believed to be the longest span of business life of any lumber handling operation now in existence.

Requirements of Walnut Logs for Export.

Will you kindly indicate what are the requirements of prime export walnut as to length, defects etc.; also what do the terms "hewn" and "planed" mean?

The term "prime logs" is understood to be about the same thing in all markets and on all classes of timber. In substance it means logs without defects—sound timber—free from large knots and hollow butt, twisted or very crooked logs or other imperfections which would detract from their worth. The requirements of various markets differ and while walnut logs six feet or over in length are acceptable in some markets they are not in others.



WALNUT LOGS READY FOR EXPORT.

A good indication of what the term "hewn logs" signifies is given in the cut accompanying this item. The logs are hewn so as to remove a large part of the sap and bark and the corners are shaved smooth, which tends to lighten the weight and lessen the cost of transportation and also to postpone discoloration and decay. In other words, the white or sap wood is taken off and the heart preserved. It is possible that "planed" means sawed, the term being used to distinguish such timber from hewn timber, though whether or not this is the case cannot be stated positively.

To be considered prime walnut logs in foreign mar-

kets logs must be straight and free from bad splits and wind shakes. Logs eighteen inches and up in diameter at the small end are the most salable. The slab must be taken off the four sides so as to show about an 8-inch face of black wood. Logs must be smoothly hewn and free from ax marks and the corners must be well rounded with a drawing knife. The ends must be sawed square and painted red. The lengths are eight feet and up. Sometimes shippers plane the corners with a hand plane, which makes the logs look very nice but subjects them to the import duty on manufactured lumber, as all customs officials at foreign ports consider logs which bear the mark of a hand plane as being manufactured.

Forestry as Practiced in Saxony.

Is forestry practiced in Saxony?

The government forests of Saxony have been made to return a considerable revenue since 1817. The following table gives a fairly accurate idea of the growth of practical forestry in that country from the date mentioned almost to the present time:

YEARS—	Net increase.
1817 to 1826.....	\$ 352,500
1827 to 1836.....	370,750
1837 to 1846.....	419,000
1847 to 1853.....	588,250
1854 to 1863.....	924,750
1864 to 1873.....	1,748,750
1884 to 1893.....	1,894,500
1894 to 1898.....	2,028,750
1899 to 1901.....	2,128,500

In the last mentioned years the government had an acreage of 434,896. It will be observed that the average year in the first period mentioned yielded a return over all expenses of about \$35,250, while during the

last period the average annual net income to the government from this forest reserve was \$1,064,250.

Restrictions and Salesmen in Canada.

Is there a restriction on the sale of lumber by nonresident salesmen in the province of Quebec?

The parliament of Quebec passed an act some time ago which reads as follows:

“It is enacted that any nonresident traveler or agent soliciting orders for goods, other than intoxicating liquors, for firms or corporations having no place of business in Canada shall require a license to cost \$300, renewable the first of May each year. Any person contravening this law is liable to a penalty of not more than \$1,000 and not less than \$500 for each infraction hereof, and no party shall lend his license to another under the penalty of \$300.”

Splitting Logs With Dynamite.

How may logs be split by the use of explosives so as not to injure them for lumber manufacture?

Opinions vary as to the number of holes which should be bored in a log and how deep they should be. But the majority appear to favor boring them well into the heart about a foot up from the ends of the logs. Half of an inch stock of dynamite should be put into each hole, after having been soaped on both ends. It should be tamped with sand or water. The log previously should have been rolled upon level ground.

Timber Preservation.

Does treatment of timber for its preservation pay?

This question depends largely upon the kind of timber used, the preserving method used and the man-

ner in which the preservative is applied. It may be said as a general proposition that the use of preservative treatment does pay. The following table will give an idea of the life of various timbers and their costs untreated and treated:

TIMBER—	Treatment.	Length of service.	Original cost.	Cost of treatment.	Annual charge.
White oak, untreated....		10 years	\$.85	...	\$.121
Red oak or loblolly pine, untreated		5 years	.40	...	.124
Red oak or loblolly pine, zinc chloride treatment		10 years	.40	\$.16	.085
Red oak or loblolly pine, zinc creosote treatment		16 years	.40	.25	.065
Red oak or loblolly pine, creosote treatment....		20 years	.40	.45	.069

Logging Regulations on Northwestern Rivers.

Can you advise as to the regulations governing rafting on Oregon streams?

June 25, 1904, Robert Shaw Oliver, assistant secretary of war, issued instructions of which the following is the text:

In pursuance of the authority conferred by act of congress, approved May 9, 1900, entitled "An act authorizing the secretary of war to make regulations governing the running of loose logs, steamboats and rafts on certain rivers and streams," the following regulations are prescribed for the Coquille river, Oregon, between its mouth and Gravel Ford, whereon the floating of loose logs is the principal method of navigation:

That during the one-hundred and forty-four (144) hours extending from midnight of each Wednesday to midnight of the following Tuesday loose timber and logs and sack rafts (so called) of timber and logs, may be run, and parties engaged in this business may use the waterway in such reasonable manner as may be necessary for the proper transaction of such business, provided that during any other period than that designated above said parties shall so arrange

their work as to leave the channel of said section of the river free from floating logs and timber and shall not obstruct or delay any other navigation interest.

Pasturage of Cutover Lands.

Can sheep or goats be raised on cutover lands?

The word cutover lands not including any designation as to locality or climatic conditions is very indefinite as regards pasturage for any particular animal. In some locations sheep could be raised on land denuded of timber and so could almost any other animal. It is claimed that angora goats are naturally best adapted to feed on these lands because of their exceptional hardiness. These goats will live in almost any climate and even in winter need no protection beyond ordinary sheds. They feed on slashings, weeds and briars and need no other fodder in summer and very little in the winter. They multiply rapidly and their fleece sells for from 35 to 40 cents a pound, being more valuable than sheep wool. They are not difficult to fence in, are not afraid of dogs and in fact require practically no attention.

Attacks of Insects on Burned Timber.

Does a forest fire leave the unburned timber more open to attack by insects?

Investigations by entomologists show that when a fire has passed over a tract of timber the trees are subject to attacks by various wood destroying insects and grubs, especially by the insect which is known as the borer. These vermin, while preying on the dead timber to some extent, are especially active against the trees which are slowly dying from the effects of the fire. They work in through the bark and sapwood and finally get into the heartwood, destroying the tim-

ber for anything except firewood. The insects seem to prefer pine to any other species, the order of attack in the mixed forest being pine, spruce, birch, hemlock, arbor vitae, balsam, beech and maple.

INDEX.

LEGAL—

Contract-s—

	PAGE
Acreage, Deficiency in.....	18
Contractors, When retailers are original.....	14
Deviation from for specific woods.....	90
Essentials of	19
Failure to deliver, Penalty for.....	15
Indefinite	10
Inferior material, Remedy for use of.....	15
Modification of	12
Quantity of timber cut, Disagreement as to.....	21
Reject shipment, Right to.....	14
Specific vs. established custom.....	15
Subcontractor, Status of.....	12
Terms must be observed.....	11
To establish	10
To sell defined.....	13
Unilateral timber	18
Unloading not acceptance.....	17
Warranty, Implied	11

Lease—

Turpentine rights under.....	10
------------------------------	----

Lien-s—

Employees' right to.....	23
Illinois, Law of explained.....	25
Kentucky law	24
Limit of, for labor.....	22
Loggers' rights for, in Michigan.....	23
Mortgage rights, Priority of.....	23
Mortgaged timber, Buying.....	24
Priority of labor.....	23
Salesmen's rights	25
To perfect	22

LEGAL—

Liability—

	PAGE
Advertised prices, Liability to pay.....	31
Agent's act, Responsibility for.....	30
Architect, Liability of.....	30
Commission not payable on unfilled orders.....	34
Damage in transit.....	27
Firm not bound by act of individual member.....	28
Injury to customer.....	33
Injury to mill employees.....	33
Injury to employees.....	34
Loss in transit.....	29
Manufacturers' rights when lumber is sold through agent	28
Manufacturers bound to fill orders accepted by agents.....	32
Ownership rights, Exercise of an acceptance.....	31
Obligation to accept all or none.....	35
Principal bound by act of agent.....	29

General—

Arkansas timber land holders protected.....	51
Arrival of vessels, Legal.....	42
Dead timber legally classified.....	40
Dower rights in timber.....	43
Floatable streams, Right to.....	37
Forest reserves, Railroad grants in.....	50
Hedgehog law, The.....	45
Homestead bill, The.....	45
Industrial lines, Divisions of through freight with...	52
Lieu selection provisions, Repeal of.....	36
Misrepresentation of credit, Recourse for.....	38
Privilege act of Mississippi.....	37
Reciprocity treaty with Canada.....	51
Regaining possession of stock.....	39
Right of railroad to cut timber from public domain..	48
Scant thicknesses, Legal views of.....	46
"Tap Line" case, What was.....	38
"Tap Line" case, Points decided by Interstate Commerce Commission	40
Tariff classification, A.....	46
Time limit removal, Selling timber without.....	50
Uniform bill of lading, The.....	44
Was the contract violated.....	47

RETAIL—

The Retail Yard—

	PAGE
Accounts, Long time.....	54
Cash business	59
Clean office, Significance of.....	65
Complete stocks, Does it pay to keep.....	59
Dellverles, How to check.....	57
Drivers, How to get good.....	58
Farm implements, Selling.....,	57
Farmers, How to get close to.....	60
Gutters, Shed	64
Inventory as basis of fire loss.....	68
Knowledge of the market, Profiting by.....	71
Labor	70
Ladders, Handy	64
Load binders	62
Loaning lumber	58
Location, Best yard.....	60
Piece-sales or "Dribble Trade".....	62
Rough roads, Carting lumber over.....	66
Starting	66
Stocks, Diversified	54
Throwing off odd change.....	55
Trade papers, What is gained by reading.....	56
Yard manager, How to handle.....	69

Care of Retail Stock—

Blackened lumber, How to utilize.....	82
Broken stock, Disposition of.....	82
Doors; how displayed.....	77
Even piles, How to make.....	74
Gates and doors, Keep in working order.....	80
Molding, How to keep.....	82
Molding racks	83
Molding, Care of.....	83
Neat appearing yards pay.....	79
Open sheds, To pile lumber in.....	76
Piling lumber, Care in.....	82
Sash and door stock room, Plan for.....	74
Showing doors, Devlce for.....	73
Storerooms, How to light.....	72
Toppling, To keep piles from.....	79
Warerooms, Dustproof	76

RETAIL—

Miscellany—

	PAGE
Advantage to wholesaler who understands retail trade	92
Buying a retail yard.....	97
Cement and concrete.....	97
Complaints, Delay in filing.....	93
Coöperative yards.....	86
Does it pay to keep posted.....	85
Field in southern California.....	98
Lime, To keep from slacking.....	94
Open quotation evil.....	88
Poacher defined.....	80
Poaching evil, Remedy for.....	91
Retail opportunities in Nevada.....	95
Retailers past and present, Comparison of.....	87
Slacked lime, Use of.....	96
Specific woods, Deviation from contracts for.....	90
Steel squares, Authority on.....	95

COMMERCIAL WOODS—

Weights, popular and botanical names of.....	165
--	-----

Hardwood-s—

Advantages of United States.....	101
Arkansas timber	107
Bay poplar, What is.....	104
Beech	117
— Qualities of.....	116
— for paving purposes.....	112
Cedar, Southern red.....	113
Chittimwood	115
Cocobola	108
Cottonwood as siding.....	114
Defined	90
Elms, Kinds of.....	119
Furniture woods, Five leading.....	112
Gum, Black.....	116
Hickory of western Pennsylvania.....	99
— Second growth.....	111
Holly, White.....	106
Industry, past and present.....	124
Jarrah	115

COMMERCIAL WOODS—

<i>Hardwoods—</i>	PAGE
Linnwood	100
— Character of.....	117
Maple, Sugar and soft.....	102
— Supply, Sources of.....	109
Mahogany, Advent ^t of.....	120
— San Domingo.....	121
— Species of.....	121
— Where grows.....	120
Oak, Best time to cut.....	118
— Proper time to cut.....	104
— Red and black.....	110
— Southern vs. Northern.....	108
— For use in ground.....	118
Poplar as siding.....	115
Thickness of green stock.....	109
Walnut, White.....	114
— Tree, Most valuable.....	119
Wisconsin	102

Softwoods—

Big tree and redwood, Distinction between.....	139
Cedar, Incense.....	140
White, Distribution of.....	136
Cypress called redwood.....	144
Defined	99
Hemlock, Diseases of.....	133
Larch, western, Uses of.....	136
Pine, Georgia and synonymous terms.....	140
— For paving blocks.....	130
— Sugar and white of the west.....	129
— Virginia sap.....	144
— White of New England.....	131
Redwood, fire resistance.....	129
— Vs. red cedar.....	134
— Reproduction of.....	143
— For conduits.....	135
Spruce, Wisconsin, Durability of.....	129
— Largest forest in the world.....	134
— Western, as interior finish.....	132
Telegraph poles, Woods suitable for.....	131

COMMERCIAL WOODS—

Distribution—

PAGE

Alaska, Timber resources of.....	163
Bahama Islands, Pine of.....	162
British Columbia's timber resources.....	160
Canada, eastern, Pine resources of.....	162
California, northern, Timber in.....	157
Cedars of North America.....	155
Cedar, poplar and cypress, Quantity and cut of....	151
Heaviest growth timber.....	150
Hudson bay country, Timber of.....	146
Isle of Pines, Pine and hardwoods of.....	162
Mexico, Timber of.....	161
Pacific coast, Timber of.....	158
Prince Edward Island timber.....	164
Siberia, eastern, Timber resources of.....	163
Smoky Mountain, N. C., Timber of.....	145
Western prairies, Absence of tree growth on.....	145
Western woods, Classification of.....	148

LOGS AND LOGGING—

Log-s—

Deadhead and stray.....	168
Key	172
Mahogany, Highest price of.....	173
"Merchantable" defined	168
Merchantable, To determine.....	170
Mill cut basis, Settlement on.....	169
— Overrun vs. log scale.....	171
Pine, white, Size of.....	172
Prices, Basis of.....	173
Size of Mt. Shasta logs.....	170
Walnut, Largest on record.....	171

Logging—

Axes, Do warm cut better than cold?.....	177
Appliances	184
Boom construction in West Virginia.....	182
Booming on the Brazos river.....	180
Boot packs	196
Cable system, Overhead.....	183
Camp fare past and present.....	176

LOGS AND LOGGING—

Logging—

	PAGE
Cutting old pine, Season for.....	197
Deadhead, Profit in.....	186
Deadheads, Raising	185
Device for mountainous country.....	189
— Tree felling	197
Dray	174
Driving, Pay for.....	187
Feeding lumber jacks.....	198
Felling fir in the Northwest.....	188
— Timber in the South.....	185
First Michigan road.....	176
Floating hardwoods	194
Frozen hands, Care of.....	174
Girdling of tupelo gum.....	200
Hauling, Economical	175
Loggers, Importance of on the Pacific.....	192
Mahogany	178
Pole roads, How built.....	181
— Road cars, Plan for.....	181
Rafting, Ocean	178
Record day's output.....	177
— Load	180
— In hauling	197
Regulations on Sabine river, Texas.....	179
— On northwestern rivers.....	514
Slang, Loggers'	196
Splash dams	174
Steam, First	179
Towing, Strangest craft used in	194
Wages of loggers in British Columbia.....	187

Log Scaling—

Crayon for wet logs.....	213
Doyle rule defined.....	204
— Accuracy of	212
Doyle-Scribner rule	205
Fractions, Disregards	213
How to scale.....	202
Log scale versus mill cut.....	210
Log scale—Thousand feet.....	207
Measurement, Basis of.....	201

LOGS AND LOGGING—

Log Scaling—

	PAGE
Mill cut, Gain in, over log scale.....	204
Rafting on the Mississippi.....	214
Rules	206
— Application of.....	215
— Comparison of	209
Scribner scale, Extension of.....	212
Stream's width, To measure.....	214
Wangum, A	214

THE SAW MILL—

Historical—

Biggest, Where is.....	221
Colonial laws governing operation of.....	220
First of record.....	216
— On the St. Croix.....	220
— In the United States.....	217
— On Pacific coast.....	217
— At Merrill, Wis.....	218
Life of town, Average.....	225
New Mexico, Starting in.....	222
Switzerland	219
Vance (Eureka, Cal.) mill, When built.....	219
Wages in the west.....	226
Walnut, Largest	218

Operation—

Bluing, Chemical prevention of.....	230
— To prevent lumber from.....	230
Bollers, To prevent burning.....	232
How the Chinese cut lumber.....	231
Oak, Manufacture of.....	232
— Wisconsin white, quarter sawed.....	231
Pile lumber, How to.....	230
Quarter sawing logs.....	233
— Explained	233
Refuse, Utilizing	232
Sawing reports, What they should show.....	229
To fasten down lumber piles.....	228
Weekly production, How to record.....	228

Machinery—

Band and circular mill compared.....	241
--------------------------------------	-----

THE SAW MILL—

<i>Machinery—</i>	PAGE
Dowell doors, When first made.....	243
Flooring, End matched, litigation.....	243
— First in the United States.....	244
Planing mill machinery introduced in Michigan...	243
Saws, Sash or mulay.....	240
Shotgun carriage feed.....	242

Drying and Dry Kilns—

As fire agents.....	245
Case hardened and honeycombed.....	247
Cypress, How to dry.....	245
— Kiln drying	246
Treatise on drying lumber,.....	244

Chemistry—

Byproducts, To secure.....	254
Cost of operating wood chemical plant.....	250
Destructive distillation	255
Ethyl alcohol, Production of.....	256
Flr oils and soap, Uses of.....	256
Properties of wood chemicals.....	248
Refuse, How it may be utilized.....	253
Turpentine from norway stump.....	248
Wintergreen oil, How to produce.....	256

Shingles—

Board measure, One thousand in.....	257
Breasted	266
Cedar, red, dimensions.....	261
First produced in Humboldt county, California....	267
First mill on Vancouver island.....	259
Interstate Shingle Company of Washington.....	265
Largest production, State of.....	257
Life of roof.....	262
Longest service by roof.....	261
Meaning of 5 to 2—6 to 2.....	260
Nails, Best	260
Pine, Yellow	266
Redwood and red cedar.....	262
Shaved, Advantages of.....	265
Specifications, Red cedar.....	263
Weavers	258
World's record of manufacture.....	259

LUMBER—

<i>Uses of Woods—</i>	PAGE
Bamboo, Why hollow.....	290
Beech as flooring.....	286
Beveled siding, End matching of.....	283
Birch for hubs.....	270
Cypress for fence posts.....	276
— For hothouse construction.....	278
— Longevity of	277
Endogenous woods, Use of.....	289
Fruit packages, Lumber used for.....	271
Furniture, Woods used for.....	279
Gum	288
— Veneer, Market for.....	282
Heart wood for outside purposes.....	269
Lath, Woods used for.....	286
— From tamarack and hemlock.....	287
— Hardwood, Demand for.....	287
— Red cedar	289
Magnolia, Market for.....	282
Maple flooring, Care of.....	276
— Soap and water on.....	277
— Use of for lumber.....	283
Match stock	285
— How handled	273
Pavement	274
Persimmon	269
Piano key stock.....	284
Pine, yellow, Painting.....	272
Siding adaptable for New Brunswick.....	286
Tupelo	269
Walnut for furniture.....	272

Inspection—

Disputed grades	291
Grading before lumber is trimmed.....	292
Hardwood, Off grade.....	293
— Uniform	295
Hemlock, Buying mill run.....	294
Log run, Firsts and seconds in.....	291
Mahogany, Rules for classification of.....	300
Norway, stained, Classification of.....	290

LUMBER—

Inspection—

	PAGE
Official inspector, Status of.....	296
Rejects	292
Russian timber, Grading of.....	299
Savannah	298
Tupelo	297
When binding	295

Measurement—

Abroad	321
Board	305
— Discussed	317
— Versus surface	316
Celling, worked hardwood, Sizes in.....	307
Cutting lumber by consecutive feet and inches.....	304
English vs. American systems.....	307
European	314
Inch lumber, rough, Thickness of.....	302
Jolsts, east and west.....	301
Lineal or board feet.....	306
Liverpool	320
Metric—equivalents in English.....	311
New York sizes.....	316
Odd lengths	310
Odd size sticks, How to measure.....	312
Petersburg standard	304
Pile, Estimating contents of lumber in.....	301
Poplar plank	308
Resawed inch lumber.....	306
Shingles, How to measure a bunch of.....	309
Standard width and thickness.....	300

Tariff—

Cabinet woods, Duties on.....	323
Canadian lumber, Effect of removal on.....	324
Fireproof lumber, Duty on.....	324
Import duty, Effect on Michigan industry.....	322
Naval stores and lumber, Duty on.....	326
Pine, white	325
Reciprocity, How it affects lumber business.....	323
Thin lumber, Duty assessed on.....	325

STATISTICAL—

Production—

PAGE

Exports during 1905.....	337
Iowa, Record year for.....	329
Latin America, Lumber trade with.....	335
Lumber product and uses.....	330
Menominee river district, White pine.....	329
Minnesota, Rank of lumber industry.....	332
Pacific coast	334
Redwood since 1894.....	335
Saginaw valley, Output of.....	329
Statistics of the Lumber Industry.....	330

Values—

Acre vs. stumpage.....	348
Canadian timber, Revenue from sale of.....	350
Fixed	341
High prices, Opposition to.....	342
Manufacture, Cost of.....	352
Pacific coast lumber in 1900 and 1905.....	347
Paving materials	338
Pine, yellow, Manufacturing cost of.....	340
— White	351
— Yellow	351
— White, Highest price paid for.....	345
— White	345
Production, Cost of.....	348
Rank, Financial of lumber industry.....	353
Reckless price list distributors.....	339
San Francisco, Early lumber prices.....	341
Stumpage	343
Walnut	339

Weights—

Manufacturers, Can they be held responsible for...	354
Michigan logs and lumber.....	355
Pine, yellow	356
— White	356

Strength—

Fir and yellow pine.....	361
— Douglas and white pine.....	361
— Pine and hemlock.....	362
— Oak and pine.....	365
Hemlock, pine and fir.....	362

STATISTICAL—

<i>Strength—</i>	PAGE
Larch or tamarack of Minnesota.....	364
Moisture, Effect of.....	359
Oaks	359
— Pine and fir.....	365
Pine, Change in quality of.....	367
— Longleaf and shortleaf.....	365
— North Carolina and longleaf.....	366
— Yellow, and fir.....	361
— White, and Douglas fir.....	361
— Norway and tamarack.....	364
— Oak and fir.....	365
— Fir and hemlock.....	362
Quarter sawed, Shrinkage of.....	366
Shrinkage	361
Tamarack and norway pine.....	364
Testing, First appropriation by congress for.....	358
Various woods	367

THE TRADE.

<i>Trade Papers—</i>	
First	369
Functions of.....	370
AMERICAN LUMBERMAN, Oldest subscriber of.....	369
<i>Trade Marks—</i>	
As an aid.....	373
Hoo-Hoo Insignia as.....	371
Regulations abroad.....	372
Use of.....	371
<i>Trade Terms—</i>	
Dead culls, Mill culls.....	377
Exogenous and Endogenous, defined.....	374
"For sale by the candle".....	377
Mill culls.....	374
Net freight measure.....	378
O. G. defined.....	376
Spring of the root.....	378
Tapped timber.....	376
Tie plug.....	373
Vertical grain.....	375
Wooded and timbered acres.....	376

FINANCIAL—

	PAGE
Bankrupts, Attitude toward.....	384
Buying and selling departments, Relative importance of.....	386
Checks, Certified.....	382
Collections by salesmen.....	380
Commission, Basis of figuring.....	380
Debt, Legal cancellation of.....	382
Discount on freight.....	380
Discounts	381
— Chicago	381
— Deducting freight before figuring.....	382
Price, Don't cut.....	385
Quotations, Postal card.....	383
Two percent ten days.....	386

ASSOCIATION-S—

Inspectors, How paid.....	391
Lumber Secretaries' Bureau of Information.....	393
National Association of Sash & Door Salesmen....	391
Of the United States.....	394
Value of, to the individual.....	392

TIMBER—

Tree Growth—

Annual rings.....	402
American trees, Famous.....	403
Mississippi Delta.....	404
Pine, Wisconsin's largest tree.....	403
Rate of.....	402
Spiral	405
Witness trees.....	405

Timber Preservation—

Creosote production.....	410
Decay, To prevent.....	407
Fence posts, Treatment to prevent decay of.....	408
— How to protect.....	410
Fireproofed	408
Methods of	511
Poles, Preservative for.....	410
Roofing, Fireproof.....	411
Sugar cured lumber.....	411

TIMBER—

<i>Timber Facts—</i>	PAGE
Boxing yellow pine, Effect of.....	417
Canadian timber, Where to get information on....	419
— Dues	422
Dead and down timber law.....	415
Frost cracks in standing timber.....	420
Fire killed timber, Value of.....	416
Insurance of standing timber.....	415
Newfoundland and Ungava regulations.....	422
Public lands timber, Sale of.....	421
Quantity of timber in United States.....	421
Taxation, High.....	422
Timber and stone act.....	418
Trespassing, First conviction of.....	414
Washington timber, Kinds and quantities of.....	418

FORESTRY—

American, Beginning of.....	424
Black Forest.....	435
Defined	428
Duties of a forester.....	429
Norwegian	436
Pine, northern, Second crop of.....	430
— Yellow, Second growth of.....	431
Policy, Aid in accomplishing.....	427
— Acceptable to all.....	430
Regulations, First.....	424
— First national.....	425
Reservation, Creation of.....	436
Russia, Penal regulations in.....	434
Russian	432
— Organization of.....	433
Saxony, as practiced in.....	509

TRANSPORTATION—

<i>Cars—</i>	
Best lumber.....	443
Big load.....	443
Equipment	467
— Flat	454
— Locomotives and cars.....	456
Failure to supply, Penalty for.....	450
Largest carload of pine.....	442

TRANSPORTATION—

<i>Cars—</i>	PAGE
— Hemlock	443
Open, Cost of equipping.....	459
— Equipment of.....	467
Placarding	453
<i>Demurrage—</i>	
Car service and shippers' rights.....	445
Claims, Collection of.....	457
Free time allowance.....	450
— for loading and unloading.....	450
Laws and state laws.....	451
No lien on.....	465
Rules, Lumbermen's views on.....	463
Virginia rules.....	458
<i>Rate-s—</i>	
At which traffic moves.....	457
Carloads of lumber.....	451
Forty-cent; when established.....	460
Joint, Cancellation of, by Santa Fe.....	468
Overcharge, How to avoid.....	449
Pacific coast lumber.....	446
<i>General—</i>	
Carriers cannot refuse shipment.....	438
Delivery, What constitutes.....	438
Delayed shipments, Responsibility for.....	455
Entire car must be accepted or rejected.....	438
Flume, Carrying lumber by.....	440
— California	468
Liability for damage on shipboard.....	480
Loss in transit, Liability for.....	452
Lumber capacity of vessels.....	487
Methods used by lumbermen.....	461
Ownership of lumber in transit.....	456
Rafting, Earliest on the Hudson.....	442
Records of loading vessels.....	488
Shippers' rights and car service.....	445
Team tracks.....	457
Transcontinental government railroad.....	439
Weight schedule, Basis of.....	459

MISCELLANY—

<i>Manufactures of Wood—</i>	PAGE
Barrels, Who made first.....	481
Nail keg manufacture.....	481
Packing box industry, Inception of.....	482
Pulpwood	482
— Woods for.....	483
— Bisulphite process for.....	483
Spools	480
Toothpicks, How made.....	480
Vehicle industry products, Value of.....	481

Railroad Ties—

Annual consumption.....	483
Are railroad ties lumber?.....	484
Durable timber, Most.....	485
Number used in one mile of road.....	484
Substitute for wooden.....	486

Ships and Shipping—

Damages, Liability for, to lumber on shipboard... 489	489
Piling, How to specify sizes desired.....	489
Vessels, Record of loading.....	488
— Rules for loading.....	487
— Lumber capacity of.....	487

Lumber Lore—

Chinese Lumbermen in the United States.....	492
Clapboards defined.....	505
Cuba, and Isle of Pines, Lumber industry of....	506
Cutover lands, Pasturage of.....	510
Fire, To guard against.....	499
First lumber yard of Toledo, Ohio.....	492
Hemlock bark, Winter and summer peel.....	491
— Mill run in.....	497
— How to dress.....	502
Hoo-Hoo, Chronological History of.....	500
Increase of timber, Natural.....	491
Isle of Pines and Cuba, Lumber industry of....	504
India, Lumber industry of.....	503
Insects, Attacks of on burned timber.....	510
Largest yellow pine forest in the world.....	491
Logging regulations on Northwestern rivers.....	509
Louisiana swamp lands.....	496
New York's timber area.....	490

MISCELLANY—

<i>Lumber Lore—</i>	PAGE
North American woodlands.....	490
Oldest lumber concern in United States.....	505
Piling, Does it pay to peel.....	502
Pine bark beetles.....	499
Placing orders, Lack of definiteness in.....	494
Preservation, Timber.....	508
— Chemical, of woods.....	512
Salesmen, Restrictions of in Canada.....	508
Samples, Selling lumber by.....	505
Saxony, Forestry as practiced in.....	507
Shoppenagons	497
Splitting logs with dynamite.....	508
Sulphur storms.....	500
Walnut logs, Requirements of, for export.....	506
White ant pest.....	493

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